

# Engineer Systems Handbook

---



May 2001

# ENGINEER SYSTEMS HANDBOOK

## CONTENTS

	<b>Page</b>
<b>PREFACE</b> .....	vi
 <b>SECTION I. DEVELOPMENTAL SYSTEMS</b>	
 <b>Mobility</b>	
Airborne Standoff Minefield Detection System (ASTAMIDS) .....	2
Antipersonnel Obstacle Breaching System (APOBS) .....	3
Countermine Capability Set (CMCS) .....	4
Engineer Bradley Fighting Vehicle .....	6
Engineer Squad Vehicle (ESV) .....	7
Grizzly .....	8
Ground Standoff Minefield Detection System (GSTAMIDS) .....	10
Handheld Standoff Minefield Detection System (HSTAMIDS) .....	12
Heavy Dry-Support Bridge (HDSB) .....	13
Improved Ribbon Bridge (IRB) .....	14
Line-of-Communications Bridge (LOCB) .....	15
Mine-Protected Clearance Vehicle (MPCV) .....	16
Mongoose—Explosive Standoff Minefield Breacher (ESMB) .....	17
Obstacle Marking System (OMS) .....	18
Rapidly Emplaced Bridge System (REBS) .....	19
Standard Robotic System (SRS) .....	20
 <b>Countermobility</b>	
Antipersonnel Land-Mine Alternative (APLA) .....	21
Hornet (Wide-Area Munitions [WAM]) .....	23
Raptor—Intelligent Combat Outpost .....	25
Selectable Lightweight Attack Munition (SLAM), M4 .....	27
Volcano, Trailer-Mounted .....	28
 <b>Survivability</b>	
High-Mobility Engineer Excavator (HMEE) .....	29
 <b>Topographic/Geospatial Engineering</b>	
Digital Topographic Support System (DTSS)—High-Volume Map Production (HVMP) .....	31
 <b>General Engineering</b>	
All-Terrain Crane (ATEC) Pile Driver .....	32
Deployable Power Generation/Distribution System (DPGDS) .....	33
Engineer Mission Modules—Water Distributor (EMM-WD) .....	34
Floodlight Set (FLS) .....	35
Heavy Engineer Crane (HEC) .....	36
Maneuver Control System—Engineer (MCS-E) .....	37
Self-Load Off-Load Trailer (SLOT) .....	39
Tactical Fire-Fighting System (TFFS) .....	40

	<b>Page</b>
Tactical Fire-Fighting Truck (TFFT) .....	41
Woodworking Set (WWS) .....	42
 <b>SECTION II. FIELDDED SYSTEMS</b>	
<b>Part 1. Mobility</b> .....	43
Aluminum Floating Footbridge .....	44
AN/PSS-12 Handheld Portable Mine Detecting Set .....	45
Armored Combat Earthmover (ACE), M9 .....	46
Armored-Vehicle-Launched Bridge (AVLB) .....	48
Bailey Bridge, M2 .....	49
Bangalore Torpedo, M1A1 .....	50
Bridge Erection Boat—Shallow Draft (BEB-SD) .....	51
Common Bridge Transporter (CBT) .....	53
Engineer Squad Carrier, M113 .....	55
Light Tactical Raft (LTR) .....	56
Medium-Girder Bridge (MGB), M3 .....	57
Mine-Clearing Line Charge (MICLIC), M58 .....	58
Pipe Fascines System (PFS) .....	60
Ribbon Bridge .....	61
Wolverine .....	62
 <b>Part 2. Countermobility</b> .....	65
Antipersonnel (AP) Mines; M14, M16, and M18 .....	66
Antitank (AT) Mines; M15, M19, and M21 .....	68
Fuse, M624 .....	69
Pursuit-Deterrent Munition (PDM) .....	70
Family of Scatterable Mines (FASCAM) Characteristics .....	71
Modular-Pack Mine System (MOPMS) .....	72
Volcano Multiple-Delivery Mine System .....	73
 <b>Part 3. Survivability</b> .....	75
Improved Body Armor Set, Individual Countermine (BASIC), Preplanned Product Improvement (P3I) (Also Known as Improved-BASIC [I-BASIC]) .....	76
Joint-Firefighter Integrated Response Ensemble (J-FIRE) .....	78
Small Emplacement Excavator (SEE) .....	79
Small Emplacement Excavator (SEE)—Hydraulic-Mounted Attachments .....	80
Soldier Fighting Cover (SFC) .....	81
Ultralightweight Camouflage Net System (ULCANS) .....	82
 <b>Part 4. General Engineering</b> .....	83
25-Ton Trailer, M172A1 .....	84
Air-Assault (AASLT) Tactical Earthmoving Equipment (T-3/4 and T-5 Dozers) .....	85
Airborne/Air-Assault Grader .....	87
Airborne Scraper System, 2,500-Gallon .....	88
All-Terrain Crane (ATEC), 22.5-Ton .....	89
Asphalt Melter .....	90
Asphalt Mixing Plant .....	91
Crane, 7.5-Ton .....	92
Deployable Universal Combat Earthmover (DEUCE) .....	93
Dual Steel-Wheeled Roller .....	94



	<b>Page</b>
Dump Trucks .....	95
Engineer Mission Modules—Bituminous Distributor (EMM-BD) .....	96
Engineer Mission Modules—Concrete Mobile (EMM-CM) .....	97
Engineer Mission Modules—Dump Body (EMM-DB) .....	98
Family of Loaders (FOL) .....	99
Heavy Road Grader .....	100
High-Speed Compactor (HSC) .....	101
Hot-Oil Heater .....	102
Hydraulic Excavator (HYEX) .....	103
Laser Leveling Device (LLD) .....	104
Low-Bed Semitrailer, M870A3 .....	105
Paving Machine, Bituminous Material .....	106
Pneumatic Tool and Compressor Outfit, 250 Cubic Feet Per Minute (cfm) .....	107
Towed Pneumatic Roller .....	108
Tractor, Full-Track, Low-Speed, Medium T-9 Dozer (D-7) .....	109
Tractor-Scraper, 14 to 18 Cubic Yards .....	111
Vibratory Plate Compactor .....	112
Vibratory Roller .....	113
Well-Drilling System, 600-Foot .....	115
<b>Part 5. Topographic/Geospatial Engineering</b> .....	<b>117</b>
Automated Integrated Survey Instrument (AISI) .....	118
Digital Topographic Support System—Base (DTSS-B) .....	120
Digital Topographic Support System—Deployable (DTSS-D) .....	121
Digital Topographic Support System—Heavy (DTSS-H) .....	123
Digital Topographic Support System—Light (DTSS-L) .....	124
Global Positioning System—Survey (GPS-S) .....	125
Topographic Support System (TSS) .....	126
<b>Part 6. Diving</b> .....	<b>129</b>
Assault Boat, 7-Man (Inflatable) .....	130
Assault Boat, 15-Man (Inflatable) .....	131
Compressor, Diving, 40 Cubic Feet per Minute (cfm) .....	132
Divers' Recompression Chamber .....	133
Diving Equipment Set, Individual Swimmer Support Set .....	134
Diving Equipment Set, Open-Circuit Scuba .....	135
Diving Equipment Set, Scuba Support, Type A .....	136
Diving Equipment Set, Scuba Support, Type B .....	137
Special Divers' Air-Support System (SDASS) .....	138
Surface-Supplied Diving Set (SSDS) .....	139
Underwater Construction Set (UCS) .....	140
Underwater Photographic-Support Set .....	141
<b>Part 7. Demolitions</b> .....	<b>143</b>
40-Pound Cratering Charge (1992 Version) .....	144
Adhesive Paste, M1 .....	144
Blasting-Cap Holder, M8 .....	145
Blasting Caps .....	145
Blasting-Cap Test Set, M51 .....	146
Blasting Machines .....	146



	Page
Cap Crimper, M2 .....	147
Composition C4 M112 Block Demolition Charge.....	147
Composition C4 M118 Block Demolition Charge.....	148
Delay-Firing Device, M1 .....	148
Demolition-Charge Assembly, M183.....	149
Destructors.....	149
Detonating Cord.....	150
Detonating-Cord Clip, M1.....	150
Detonators.....	151
Firing Wire and Reels .....	152
Military Dynamite, M1 .....	153
Modernized Demolition Initiators (MDIs).....	154
Pressure-Sensitive Adhesive Tape.....	155
Priming Adapters, M1A4 and M1A4A1 .....	155
Shaped Demolition Charges.....	156
Supplementary Adhesive for Demolition Charge .....	157
Time Blasting Fuse .....	157
Trinitrotoluene (TNT) Block Demolition Charge.....	158
Waterproof Sealing Compound .....	158

### SECTION III. SETS, KITS, AND OUTFITS

<b>Part 1. Sets.....</b>	<b>159</b>
Bridge Conversion Set, Fixed Bridge.....	160
Bridge Erection Set, Fixed Bridge: Highway; Pony Truss; Widened Roadway; Bailey Type; or Cable Reinforcement.....	161
Bridge Erection Set, Floating Bridge: Aluminum Deck Balk Superstructure.....	162
Bridge Erection Set, Floating Bridge: Class 60 With Steel Superstructure.....	163
Bridge Erection Set, Floating Bridge: Class 60 With Steel Superstructure or Floating Bridge With Aluminum Deck Balk Superstructure.....	164
Bridge, Fixed: Highway, Aluminum, 38 Feet Long .....	165
Bridge, Fixed: Highway; Pony Truss, Portable Panel; Widened Roadway; or Bailey Type.....	166
Bridge, Floating: Aluminum, Highway, Deck Balk Superstructure.....	167
Bridge, Floating: Raft Section, Light Tactical .....	168
Bridging Sets In Depot For Contingency Operations .....	169
Crushing and Screening Plant, 225 Tons Per Hour (TPH).....	169
Demolition Equipment Set, Explosive Initiating, Electrical and Nonelectrical .....	170
Drafting Equipment Set: Battalion for Charts, Sketches, and Overlays.....	170
Light Set, Chart Field.....	171
Light Set: General; Illumination, 15 Kilowatt (kW) .....	171
Mat Set, Landing, XM18 and XM19 .....	172
Reinforcement Set, Medium Girder .....	172
Shop Equipment, Cutting and Welding: Underwater, Electrical .....	173
Sketching Set, Surveying: Military Field Sketching.....	173
Supplementary Set, Bridge.....	174
Surveying Set, General Purpose .....	174
Surveying Set, Topographic Section .....	175
Test Set, Asphalt.....	175
Test Set, Concrete .....	176
Test Set, Soil .....	176
Topographic Support Sets.....	177

	<b>Page</b>
<b>Part 2. Kits</b> .....	179
Other Kits .....	180
Repair and Refilling Kit, Carbon-Dioxide Extinguisher.....	180
Tool Kit, Carpenter: Engineer Platoon.....	181
Tool Kit, Carpenter: Engineer Squad.....	181
Tool Kit, Electrician.....	182
Tool Kit, Mason and Concrete Finisher.....	182
Tool Kit, Pioneer Engineer Combat Platoon.....	183
Tool Kit, Pioneer Engineer Squad: Land Clearing and Building Erection.....	183
Tool Kit, Pioneer Platoon: General Labor.....	184
Tool Kit, Pipe Fitter, 1/8- to 2-Inch-Diameter Pipe .....	184
Tool Kit, Pipe Fitter, Supplemental: 2 1/4- to 4-Inch-Diameter Pipe.....	185
Tool Kit, Pipeline Construction .....	185
Tool Kit, Pipeline Construction, Grooved Coupling: Pipeline Maintenance.....	186
Tool Kit, Plumber.....	186
Tool Kit, Precision Instrument Repair .....	187
Tool Kit, Rigging, Wire Rope: Cutting, Clamping, and Splicing, With Chest .....	187
Tool Kit, Supplemental Pipeline Construction, Welder's Miscellaneous Hand Tools and Equipment.....	188
Tool Set, Pioneer Squad: Light .....	188
<b>Part 3. Outfits</b> .....	189
Rock-Drilling Equipment: For Placement of Explosives .....	190
Shop Equipment, Contact Maintenance, Truck-Mounted.....	190
Shop Equipment, General-Purpose Repair, Semitrailer-Mounted.....	191
Shop Equipment, Organizational Repair, Light, Truck-Mounted.....	191
Shop Equipment, Woodworking: Base Maintenance, Trailer-Mounted.....	192
Tool Outfit, Hydraulic-System Test and Repair Unit (HSTRU).....	192
<b>APPENDIX A. UNIT REFERENCE SHEETS</b> .....	193
<b>APPENDIX B. ENGINEER SYSTEM PRIORITIES AS OF JANUARY 2001</b> .....	217
<b>GLOSSARY</b> .....	219
<b>INDEX</b> .....	237

## **PREFACE**

The Engineer Systems Handbook is designed to acquaint the reader with both developmental and fielded engineer equipment. If a system has achieved first-unit-equipped (FUE) status, it is in the fielded section of this handbook. This handbook presents systems arranged according to the five traditional engineer battlefield functions: mobility, countermobility, survivability, general engineering, and topographic/geospatial engineering. There are also separate sections covering demolitions; diving; and sets, kits, and outfits.

This handbook provides a general description and illustration of the operational capabilities and configuration of engineer equipment and tools. It is not intended as a substitute for field or technical manuals associated with individual systems.

As an integral and vital member of the combined-arms team of the Army's Legacy, Interim, and Objective forces, the Engineer Regiment is in the midst of significant changes in every step of the Army transformation effort. Therefore, each engineer combat system displayed herein is coded to indicate its potential for application to the Legacy, Interim, and Objective forces. For this publication, the Legacy, Interim, and Objective forces are defined as follows:

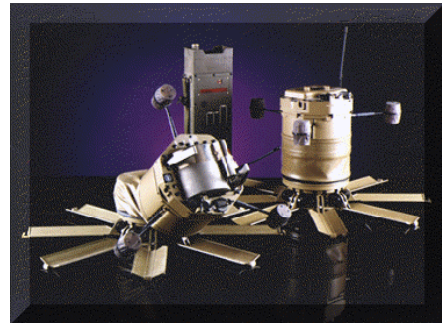
- Legacy—presently fielded or planned to be fielded to the Army's Legacy Force and/or Force XXI divisions.
- Interim—the item is on an Interim Brigade Combat Team (IBCT) or Interim Division (IDIV) table of organization and equipment (TOE) **or** has the potential to be incorporated into existing or future Interim Force organizations.
- Objective—has the potential to meet Army requirements for the Objective Force.

Current engineer system priorities (see Appendix B) are subject to change in the near future, driven by emerging technologies and requirements that support the Army of the future.

The United States Army Engineer School (USAES) Directorate of Training (DOT) developed this handbook in cooperation with the Maneuver Support Center (MANSCEN) Directorate of Combat Developments (DCD), Engineer Division. This is an example of MANSCEN synergy in action. We welcome comments and suggestions to improve this handbook. Comments and recommendations may be sent directly to the Directorate of Combat Developments, ATTN: ATZT-DCE (LTC Greene), 329 MANSCEN Loop, Suite 141, Fort Leonard Wood, Missouri 65473-8929. Telephone, FAX, and e-mail inquiries may be directed to: DSN 676-6190; Commercial (573) 563-6190; FAX (573) 563-5056; e-mail [greenh@wood.army.mil](mailto:greenh@wood.army.mil). This handbook is also available on the USAES website: [http://www.wood.army.mil/DCD/nolimits/endiv/main\\_page.htm](http://www.wood.army.mil/DCD/nolimits/endiv/main_page.htm). The systems are broken down into the area responsible for the system (organization, concepts, or materiel).

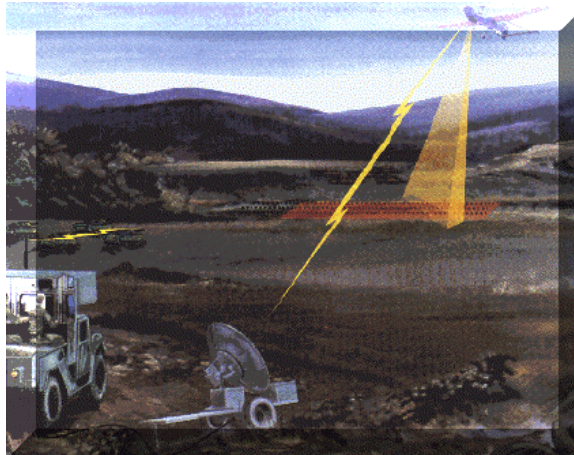


**SECTION I**  
**DEVELOPMENTAL SYSTEMS**



## **Airborne Standoff Minefield Detection System (ASTAMIDS)**

---



**DESCRIPTION:** The ASTAMIDS is a developmental effort to provide the tactical commander with an airborne capability to detect mine threats during combat or stability and support operations (SASO). From a standoff distance, the ASTAMIDS will identify minefield locations, alerting the commander to where he can or cannot maneuver. To support the tactical mission, the ASTAMIDS will fly on a tactical unmanned aerial vehicle (TUAV) with the mission to detect scatterable, recently buried, and surface-laid antitank (AT) mines. The tactical ASTAMIDS will provide real-time countermine information to the maneuver-force commander. The SASO ASTAMIDS will be flown on a UH-60 helicopter with the mission to locate buried, weathered mines. Data will be accumulated on the helicopter for later processing, using soldiers to assist in the identification of suspected mines and minefield locations. An interim ASTAMIDS will use current TUAV electro-optic/infrared (EO/IR) sensors and a modified software package to achieve some near-term capability.

**STATUS:** The program reverted back to a 3-year Tech Base Phase in January 1998.

**EMPLOYMENT CONCEPT:** The tactical ASTAMIDS will fly on the brigade commander's TUAV along maneuver corridors (before the main body crossing the line of departure) to identify those AT mine threats that the opposing forces may have emplaced before the commander's last intelligence update. Mine information is immediately processed and provided to the commander, allowing time to reorganize the force for a breaching operation or to search for a bypass. The SASO ASTAMIDS allows the commander to search areas within his sector, before maneuver or occupation, for mine threats. The type of mine typically found, buried and weathered, can be more difficult to find depending on the terrain and vegetation overgrowth. The system will fly at optimal times or under conditions that maximize system performance. Data will be collected from the UH-60 platform and processed following the mission, with a soldier to help identify mined areas.

**BASIS OF ISSUE:** The fielding of the tactical ASTAMIDS will mirror the fielding of the TUAV. It is a "plug and play" package to support the brigade commander. The SASO ASTAMIDS will support contingency operations as part of the Countermine Capability Set (CMCS).

LEGACY

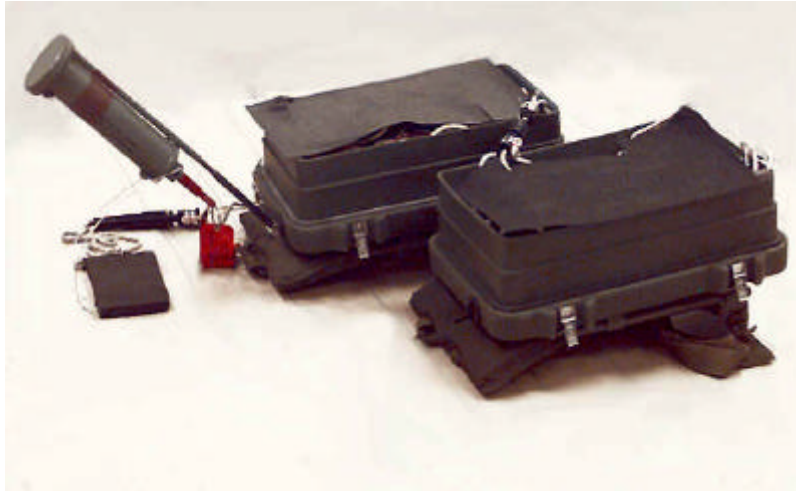
INTERIM

OBJECTIVE

---

## Antipersonnel Obstacle Breaching System (APOBS)

---



**DESCRIPTION:** The APOBS is a 110-pound, portable, explosive minefield-breaching device capable of creating a footpath for foot soldiers through antipersonnel (AP) minefields and wire entanglements. The system clears a lane 45 meters (50 meters desired) long and 0.6 meter (1 meter desired) wide and is capable of being fired from a covered/concealed position. Multiple systems may be employed to create longer/wider breaches.

**STATUS:** The APOBS is a United States (US) Marine Corps full-scale engineering development program. The date of availability is 4QFY02.

**EMPLOYMENT CONCEPT:** The APOBS will be employed by dismounted, armored engineer, infantry, and cavalry soldiers at the squad level to create footpath breaches in minefields and wire obstacles through which soldiers can move during an attack. The system will be transported by a maximum of two soldiers who will advance under smoke and suppressive fires to a standoff of 25 meters from the edge of the obstacle (or the end of the previous breach) and set up, aim, and fire the device across the obstacle. The breach may then be improved by using additional APOBSs or other available countermine techniques as the situation permits.

**BASIS OF ISSUE:** The APOBS will be issued in the basic load of engineer units. As a Class V item, it will be drawn as required from ammunition supply points. It will be carried in organic-unit vehicles in order to conduct deliberate breaches.

**TRAINING/PERSONNEL:** Training will encompass all phases of instruction to include initial-entry training (IET), individual and team training, and new equipment training.

LEGACY

INTERIM

OBJECTIVE

---



### Countermine Capability Set (CMCS)

---



**DESCRIPTION:** The CMCS is a suite of countermine equipment designed for, but not limited to, support and stability operations (SASO), specifically route and area clearance. The CMCS will consist of mine detection, neutralization, clearing, marking, and protection equipment. The following specific countermine equipment will be included:

- Lightweight rollers and plows.
- Magnetic mine countermeasures.
- Mine-clearance-armor protection kits.
- Individual body-armor protection sets.
- Vehicle-mounted mine detectors.
- Mine-resistant vehicles.
- Protection kits for critical wheeled vehicles.
- Advanced metal detectors.
- A mine information and recording system.

**STATUS:** The CMCS requirement is currently being validated. The first CMCS set will be ready for issue in FY03.

**EMPLOYMENT CONCEPT:** The CMCS will be stored as an operational project and will be issued to units in support of SASO.

**BASIS OF ISSUE:** There will be a total of three operational project packages and one training set.

## Developmental Systems – Mobility

**COMPONENTS:** The following are the components of the CMCS:

- Interim vehicle-mounted mine detector (IVMMD) – 2 sets.
- Ground Standoff Minefield Detection System (GSTAMIDS), Block 0 – 2 sets.
- Advanced handheld mine detector (for high-ferrous soils) – 75 sets.
- Improved hand-emplaced minefield marking set – 18 sets.
- Mine marking foam – 24 sets.
- Picket driver for small emplacement excavator (SEE) – 9 sets.
- Miniflail – 3 sets.
- Hand-emplaced neutralization device – ammo item.
- Mine-clearing armor protection for D-7 – 6 sets.
- Crew protection kit for deployable universal combat earthmover (DEUCE) – 6 sets.
- 5-ton and heavy, expanded mobility tactical truck (HEMTT) armor kits – 8 sets.
- Body Armor Set, Individual Countermine (BASIC) – 75 sets.
- Mine-protected control vehicle (MPCV) – 4 sets.
- Abrams Panther – 4 sets.
- Lightweight mine rollers for M2, M113, and interim armored vehicle (IAV) – 6 sets.
- Lightweight surface mine plows for M2, M113, and IAV – 6 sets.
- Magnetic signature duplicator – 6 sets.

**TRAINING/PERSONNEL:** Contract support mobile training teams (MTTs) will be used to train the CMCS for deployment until the formal course begins in 2005 at the United States Army Engineer School (USAES) at Fort Leonard Wood, Missouri.

LEGACY

INTERIM

OBJECTIVE

---

## Engineer Bradley Fighting Vehicle

---



**DESCRIPTION:** The Engineer Bradley Fighting Vehicle (Operation Desert Storm—Engineer [ODS-E]) is identical to the infantry's model M2A2 ODS Bradley Fighting Vehicle (BFV), retaining the 25-millimeter (mm) Bushmaster cannon; the 7.62-mm coax machine gun; and the tube-launched, optically-tracked, wire-guided (TOW) missile launcher. Only minor modifications to internal stowage are being considered. The under-seat, internal TOW storage racks will be removed to allow space for additional demolition stowage. Additionally, extra tie-down straps will be added for the stowage of engineer-unique equipment.

**STATUS:** The operational concept was approved at the United States (US) Army Training and Doctrine Command (TRADOC) and passed to Headquarters, Department of the Army (HQDA) in January 1998. A July 2000 decision to field the digitized M2A2 ODS was approved by the Deputy Chief of Staff for Operations and Plans (DCSOPS). The DCSOPS approved an implementation plan to field the ODS-E to the counterattack corps and to the 2nd Infantry Division in October 2000.

**EMPLOYMENT CONCEPT:** Engineers will employ the ODS-E in the same role as they currently employ the M113-series armored personnel carrier (APC). However, engineers will realize significant increases in mobility, survivability, lethality, and mounted combat capability as compared to the APC.

**BASIS OF ISSUE:** The ODS-E will replace M113-series APCs in the Counterattack Corps (1st Cavalry Division [1CD], 4th Infantry Division [4ID], 3d Infantry Division [3ID], and 3d Armored Cavalry Regiment [3ACR]) and in the 2nd Infantry Division (2ID). The ODS-E will be a one-for-one replacement of engineer APCs. Battalions will have 29 (4 per platoon or 9 per company [2 platoons plus 1 for the headquarters [HQ]; 3 companies at 9 per company plus 2 for the HQ). The armored combat regiment engineer company will have 13 (3 platoons at 4 per platoon plus 1 for the HQ).

**TRAINING/PERSONNEL:** Engineer additional skill identifiers (ASIs) have been approved for attendance to the Basic Bradley Transition Course, The Bradley Leader Course, and the Master Gunner Course.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---



## Engineer Squad Vehicle (ESV)

---



**DESCRIPTION:** The ESV is a variant of the Infantry Carrier Vehicle (ICV) that is part of the family of Interim Armored Vehicles (IAVs). The ESV is C-130 deployable and capable of sustained hard-surface speeds of 40 miles per hour with a cruising range of 300 miles without refueling. The ESV will carry a squad of nine and provide mobility and limited countermobility support. Obstacle neutralization systems integrated with the ESV include a full-width blade, a lightweight roller, and a magnetic signature duplicator.

**STATUS:** A contract award was made in December 2000 to General Motors General Dynamics Land Systems Defense Group as the manufacturer of the IAV based on the LAV III chassis.

**PROGRAM DOCUMENTATION:** The IAV operational requirements document (ORD), dated April 2000.

**ARMY ACQUISITION OBJECTIVE:** 72 vehicles.

**FIRST-UNIT-EQUIPPED DATE:** FY03.

**BASIS OF ISSUE:**

9 per Interim Brigade Combat Team (IBCT) Engineer Company  
12 per Combat Company, Engineer Regiment, Interim Division

LEGACY

INTERIM

OBJECTIVE

---

### Grizzly

---



**DESCRIPTION:** The Grizzly is a military load classification (MLC) 70 complex-obstacle breaching vehicle that integrates advanced countermine and counterobstacle capabilities into a single survivable system. The Grizzly incorporates a full-width mine-clearing blade, a power-driven arm for obstacle reduction and digging, and a commander's control station (crew compartment) on a refurbished M1 tank chassis. It will have a remote-fired .50-caliber machine gun and grenade-launched screening smoke for self-defense. The Grizzly is to be manned by a two-person crew of military occupational specialty (MOS) 12B personnel. It will breach a 600-meter complex obstacle in 21 minutes and an antitank (AT) ditch in 5 minutes. The Grizzly will be capable of breaching other types of natural and man-made, simple and complex obstacles, creating a lane for vehicles to follow. It will integrate the technologies incorporated in the M1 and M2A3 chassis with the Grizzly mission modules. The Grizzly is designed to provide the digitized division with mobility support for decisive operations.

## Developmental Systems – Mobility

**CURRENT STATUS:** Program Budget Decision (PBD) 745, issued by the Office of the Secretary of Defense on 27 December 1999, removed funding in FY01 and beyond from the Grizzly program. This decision was driven by fiscal pressures due to changing priorities necessitated by the Army's transformation. Congress appropriated \$15 million for FY01 to continue development.

This year, the government was going to accept the two Grizzly prototypes from the contractor and begin developmental and user testing. However, PBD 745 resulted in a scaling back of those efforts. The contractor recently completed shakedown testing on the two prototype vehicles in order to characterize their capabilities: primarily mine clearing with the automatic depth control (with the mine-clearing blade) and AT ditch breaching (with the power-driven arm).

The current Grizzly program definition and risk reduction (PDRR) contract is scheduled for completion on 31 August 2001. No decision on future production plans has been made at this time.

**EMPLOYMENT CONCEPT:** The Grizzly is employed as an integral part of the digital maneuver-battalion task force. The Grizzly, as part of the breach force and supported by friendly direct and indirect fires, will reduce threat obstacles and create a safe one-way passage lane for M1/M2-equipped forces to follow. A Grizzly-equipped task force can execute breaching operations with minimal preparation and with little or no loss of task-force momentum or need for lane proofing.

**BASIS OF ISSUE:** The Army acquisition objective (AA0) is 911. The Army procurement objective (APO) is 124. The basis-of-issue plan (BOIP) is 12 per heavy division and corps (mechanized) engineer battalion and 6 per armored cavalry regiment (ACR) and separate heavy brigade engineer company.

**TRAINING/PERSONNEL:** Institutional and unit training to qualify operators and maintainers will include training aids, devices, simulations and simulators (TADSS), including actual vehicles. Appropriate entry MOS, officer, and noncommissioned officer (NCO) courses will be adjusted to reflect changes to doctrinal and employment concepts. Unit sustainment training will supplement and reinforce the skills learned in the institutional course. Embedded training will be a preplanned product improvement (P3I) initiative.

LEGACY

INTERIM

OBJECTIVE

---



### Ground Standoff Minefield Detection System (GSTAMIDS)

---



**DESCRIPTION:** The GSTAMIDS is a time-phased development program designed to provide the war fighter an incremental, near-term capability to execute the on-route countermine mission while continuing to develop objective capabilities. The GSTAMIDS will be developed in three sequential blocks. Block 0 is an upgrade over the current Interim Vehicular-Mounted Mine Detection (IVMMD) System. Blocks 0 and 1 will employ downward-looking detection arrays to locate antitank (AT) mines, while Block 2 will employ a forward-looking mine-detection and -avoidance capability to the force.

**EMPLOYMENT CONCEPT:** The primary mission for the GSTAMIDS Blocks 0 and 1 is route clearance. The GSTAMIDS will be deployed in echelon using two or three systems abreast, with appropriate spacing, dependent upon the width of the route to be cleared. The GSTAMIDS Block 0 will be teleoperated from a mine-protected clearance vehicle (MPCV), and will automatically detect and mark all metallic and nonmetallic AT mines. Once located and marked, AT mines will be confirmed and neutralized by soldiers operating from within the MPCV using a mechanical device. The GSTAMIDS Block 1 will build upon the capabilities of the GSTAMIDS Block 0 and will provide the war fighter with enhanced detection capability and faster clearance through emerging mine confirmation and neutralization technology. Minefield information will be reported through compatible command, control, communications, computers, and intelligence (C4I) systems to the maneuver commander as a force-protection tool. The GSTAMIDS Block 2 will employ forward-looking mine-detection and -avoidance capabilities and will be available for use on a wide variety of military vehicles.

**STATUS:** The GSTAMIDS Block 0 is currently in engineering and manufacturing development (EMD). Block 1 is in the program definition and risk reduction (PDRR) phase of development. Block 2 will be a future effort.

<u>Milestone (MS) Decision</u>	<u>Block 0</u>	<u>Block 1</u>	<u>Block 2</u>
MS 0	26 May 1992	N/A	N/A
MS I	16 July 1997	November 2000	FY05
MS II	8 December 1998	FY03	FY08
MS III	1QFY02	FY05	FY11

## Developmental Systems – Mobility

**BASIS OF ISSUE:** Ten Block 0 systems (modified Meerkat and Control Vehicle) will upgrade the IVMMD System in the Countermine Capability Set (CMCS). The current plan is to field 170 Block 1 systems to corps wheeled combat-engineer battalions or multifunctional battalions once their structure is settled. The basis of issue (BOI) for Block 2 has not been developed.

LEGACY

INTERIM

OBJECTIVE

---

## **Handheld Standoff Minefield Detection System (HSTAMIDS)**

---



**DESCRIPTION:** The HSTAMIDS is a handheld mine detector capable of detecting all metallic and nonmetallic antitank (AT) and antipersonnel (AP) mines. It combines the maturing technology of ground penetrating radar (GPR) and an improved metal detector to provide a robust probability of detection for both large and small metallic and nonmetallic AT and AP mines. The HSTAMIDS will significantly improve the detection of the smaller, low-metal AP mines by allowing the operator to tune out metallic clutter. The HSTAMIDS's overall design weight will be comparable to that of the current AN/PSS-12 for both the detector-head and the control equipment. Integral to the success of this program is an improved soldier-machine interface and a more robust training package to create better-trained and confident operators.

**STATUS:** The HSTAMIDS is in the engineering and manufacturing development (EMD) phase. The updated HSTAMIDS operational requirements document (ORD) was approved on 23 October 2000. Program milestones are listed below:

Milestone 0: 28 May 1992

Milestone I: 6 November 1995

Government check test: June 1998, September 1998, and January 1999

Date (soldier excursion): May 2000

Milestone II: November 2000

Initial Operational Test and Evaluation (IOT&E): FY03

Milestone III (type classification): FY04

Production award option: FY04

**EMPLOYMENT CONCEPT:** The HSTAMIDS is employed in both predictable and unpredictable scenarios. It will be used to widen existing lanes through a minefield, create new lanes, or clear the entire mine obstacle. It will assist in reconnaissance missions on route and bivouac-site clearing or supporting contingency operations. The HSTAMIDS will also provide an effective mine-detection capability to the commander or troops that find themselves in an unanticipated mine environment and need to extract themselves and their equipment.

**BASIS OF ISSUE:** The HSTAMIDS is forecast to be a one-for-one replacement for the AN/PSS-12 within engineer units. Army-wide fielding is possible but not currently funded.

LEGACY

INTERIM

OBJECTIVE

## Heavy Dry-Support Bridge (HDSB)

---



**DESCRIPTION:** The HDSB is a modular bridge that can span a 40-meter gap in 90 minutes with eight soldiers. One bridge set provides either one 40-meter bridge or two 20-meter bridges. The bridge will cross military load classification (MLC) 96W/70T traffic and will allow the crossing of a heavy-equipment transporter carrying an M1A1 tank. The HDSB is designed for transportation as a palletized load by the common bridge transporter (CBT), Palletized Load System (PLS) trailers, or service-support units equipped with PLS trucks. A bridge set will consist of six M1077 flat-rack loads of bridge components, one M1077 flat-rack load of launch beams, and a launcher vehicle.

**STATUS:** Based on the results of the source selection process, a contract award was issued to Williams-Fairey Engineering Limited (WFEL) on 10 June 1999 for the HDSB program. The initial contract is a five-year contract for 27 systems. The first HDSB system will be delivered for product verification testing tentatively scheduled for November 2001. An initial operators test and evaluation will be conducted at Fort Hood, Texas, in April 2002. The first-unit-equipped (FUE) date is scheduled for March 2003.

**EMPLOYMENT CONCEPT:** The multirole bridge company (MRBC) will employ the HDSB primarily for sustainment bridging. It will fill a limited assault role when either the Wolverine is unavailable or the gaps are greater than 24 meters.

**BASIS OF ISSUE:** Each MRBC will be issued four HDSB systems. Each HDSB system will consist of one launcher mounted on an M1075 PLS chassis, one 40-meter bridge with four ramps, four PLS trailers, and seven M1077 flat racks.

**TRAINING/PERSONNEL:** Institutional and unit training to qualify operators and maintainers will be accomplished using training aids and devices. Appropriate officer and noncommissioned officer (NCO) courses will be adjusted to reflect changes in doctrinal, employment, and maintenance concepts. Unit sustainment training will supplement and reinforce the skills learned in the institutional course.

LEGACY

INTERIM

OBJECTIVE



## Improved Ribbon Bridge (IRB)

---



**DESCRIPTION:** The IRB is an improvement of the fielded ribbon bridge. It includes the following components:

Line item number (LIN) standard ribbon bay (SRB): Interior bay K97376, ramp bay R10527

LIN IRB: Interior bay M26600, ramp bay M26700

National stock number (NSN) SRB: Interior bay 5420-00-071-5322, ramp bay 5420-00-497-5276

NSN IRB: Interior bay 5420-01-470-5824, ramp bay 5420-01-470-5825

The IRB bays are modified ribbon bays. They will possess better hydrodynamics, providing the capability of rafting or bridging military load classification (MLC) 80T traffic in currents up to 8 feet per second (fps). The bays can be connected in one minute and can be connected to the SRB. The ramp bays can be hydraulically articulated to 1.16 meters for cross-wheeled vehicles and 2 meters for tracked vehicles.

**STATUS:** Durability testing of the IRB is scheduled for March to June of 2002. A contract was awarded to EWK in May 2000. Tentatively, the IRB will begin production in 2QFY01. Developmental and operational testing is scheduled to begin 3QFY02 with the first fielding scheduled for 2QFY03.

**EMPLOYMENT CONCEPT:** The IRB will be employed in the same general manner as the SRB. However, it will be able to cross swifter-moving water with higher MLCs and banks that are up to 2 meters high. Current SRB ramps can accommodate banks up to 1.12 meters high.

**BASIS OF ISSUE:** The IRB is a one-for-one replacement for the SRB.

**TRAINING/PERSONNEL:** Institutional and unit training to qualify operators and maintainers will be accomplished using training aids and devices. Appropriate officer and noncommissioned officer (NCO) courses will be adjusted to reflect changes in doctrinal, employment, and maintenance concepts. Unit sustainment training will supplement and reinforce the skills learned in the institutional course.

LEGACY

INTERIM

OBJECTIVE

---

## Line-of-Communications Bridge (LOCB)

---

**DESCRIPTION:** The LOCB is a modular, rapidly erectable bridge capable of spanning gaps longer than 40 meters for military load classification (MLC) 105 wheeled equipment and MLC 80 tracked equipment. The LOCB may also be used on top of existing low-MLC or damaged bridges. It must be erectable within 12 hours by unskilled labor (if necessary) with mechanical assistance provided by equipment organic to combat-heavy battalions. It will have a single-lane load capability of MLC 80 tracked, MLC 105 wheeled required, MLC 115 wheeled desired, and MLC 50 dual-lane capability.

**STATUS:** The operational requirements document (ORD) is currently being developed.

**EMPLOYMENT CONCEPT:** The minimum amounts of LOCBs would be purchased to maintain a specific number of sets in pre-positioned organizational materiel configured to unit sets (POMCUS) and depot supply (theater reserve). Surge contracts will be established to meet operational needs.

**BASIS OF ISSUE:** To be decided (TBD).

**TRAINING/PERSONNEL:** Training will be required for combat engineers and appropriate members of other services who deploy bridges. Training will be conducted during initial-entry training (IET), at resident schools, and through unit sustainment.

LEGACY

INTERIM

OBJECTIVE

---

## **Mine-Protected Clearance Vehicle (MPCV)**

---



**DESCRIPTION:** The MPCV is a blast-resistant vehicle intended to protect soldiers from the effects of mine blasts during route-clearance operations as part of the Ground Standoff Minefield Detection System (GSTAMIDS) Block 0. Soldiers will remotely control the functions of the GSTAMIDS mine-detection vehicle (MDV) from the MPCV. Soldiers using teleoperation capability from the MPCV are afforded standoff protection from the effects of possible antitank (AT) mine blasts during mine-detection and confirmation missions. The system uses a hydraulic arm to interrogate the suspected mine site.

**STATUS:** The two competing systems (Buffalo and Caspier) are undergoing a foreign comparative test (FCT) to determine the most appropriate vehicle to serve as the MPCV. Milestones are as follows:

FCT: March to May 2001

Down select: June 2001

Integration into GSTAMIDS: June 2001

Contractor: Buffalo—Technical Solutions Group, Charleston, South Carolina;

Caspier—Critical Solutions International, Manassas, Virginia

**EMPLOYMENT CONCEPT:** The MPCV follows about 125 meters (for three vehicles in echelon, this is mission, enemy, terrain, troops, time available, and civilian considerations [METT-TC] dependent) behind the MDV. The MPCV consists of a five-soldier crew. The MPCV operator drives the MPCV and stays within the marked path created by the MDV. The driver stops before each suspected mine marked on the road by the MDV while staying within the path marked by the MDV. Once the MPCV has stopped at a suspected mine, the mechanical-arm confirmation operator (MACO) operates the hydraulic arm to confirm or deny the presence of a mine. If a mine is found, the MACO will move the mine off to the side of the road for subsequent neutralization. Once the MACO has completed all required actions, the MPCV driver proceeds to the next mine declaration. The vehicle teleoperation (VT) operator controls the speed and direction of the MDV through the VT operator control unit (OCU). The GSTAMIDS operator monitors the GSTAMIDS Block 0 system functions and a waterfall display of mine-marking activity through the GSTAMIDS display unit (GDU). The fifth crewmember is a noncommissioned officer (NCO) who provides supervision and command and control (C<sup>2</sup>) of all operations within the MPCV.

**BASIS OF ISSUE:** The MPCV will be fielded on a one-for-one basis with GSTAMIDS Block 0 and GSTAMIDS Block 1.

LEGACY

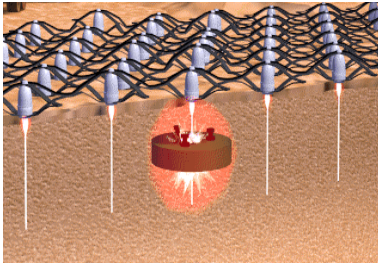
INTERIM

OBJECTIVE

---

## Mongoose—Explosive Standoff Minefield Breacher (ESMB)

---



**DESCRIPTION:** The Mongoose is an explosive countermine system that creates a vehicular lane by explosively neutralizing all surface and buried antitank (AT) mines from a position beyond their lethal radius. The ESMB consists of a rocket-propelled explosive neutralization system (ENS) with shaped charge munitions embedded in a scalable oblong net, capable of neutralizing mines with 5-inch overburden. The system works by attacking the mine's explosive component, not the mine's fuze mechanism. Munition spacing ensures that all AT mines of at least 8 inches in diameter will be destroyed.

**EMPLOYMENT CONCEPT:** The Mongoose is towed to the breaching point. It deploys at a 50-meter standoff distance from the minefield to the front of the vehicle via an inert tether. The Mongoose automatically adjusts the launch angle to compensate for terrain, wind, and temperature variations. A hand-held control display unit is used (from within the vehicle) to execute all Mongoose arming and employment functions, including raising and launching the rocket and detonating the ENS. Multiple launches may be required to breach deeper minefields. Second and subsequent shots are fired from within the lane just created. A proofing asset is required to validate the cleared lane.

**STATUS:** The Mongoose operational requirements document (ORD) was updated to support the interim brigade combat team (IBCT) and Legacy forces and was approved on 23 October 2000. The program re-entered engineering and manufacturing development (EMD) in November 2000. The first-unit-equipped (FUE) date is in FY05.

**BASIS OF ISSUE:** One-for-one replacement for the mine-clearing line charge (MICLIC). The IBCT engineer companies have six systems (2 per platoon, 3 platoons).

LEGACY

INTERIM

OBJECTIVE

---

## **Obstacle Marking System (OMS)**

---

**DESCRIPTION:** The OMS is a common marking system that can be adapted to breaching, clearing, or other designated vehicles. The OMS meets the requirements for breaching and clearing operations according to Field Manuals (FMs) 20-32 and 90-13-1. It enables following forces to locate and identify breaches, cleared areas, and previously laid threat or friendly mines/minefields.

**STATUS:** The operational requirements document (ORD) is currently being staffed.

**EMPLOYMENT CONCEPT:** Primarily engineer and military police (MP) squads; nuclear, biological, and chemical (NBC) reconnaissance teams; and select vehicle crews will use the OMS. These squads and crews will use this system to do what currently takes at least a platoon's and sometimes a company's worth of assets to accomplish.

**BASIS OF ISSUE:** To be decided (TBD).

**TRAINING/PERSONNEL:** TBD.

LEGACY

INTERIM

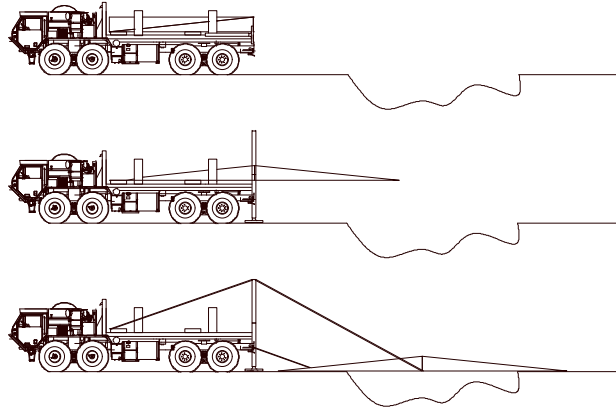
OBJECTIVE

---



## Rapidly Emplaced Bridge System (REBS)

---



**DESCRIPTION:** The REBS is a self-deployable/-retrievable bridge that provides the interim brigade combat team (IBCT) an expedient tactical gap-crossing capability. The REBS can be employed by two soldiers in less than ten minutes and is air transportable by the C-130. The REBS is a military load classification (MLC) 30 bridge capable of crossing gaps up to 13 meters wide.

**STATUS:** Selection of a REBS is scheduled for FY01 with testing in FY02.

**EMPLOYMENT CONCEPT:** The REBS is a rapidly deployable/retrievable bridging asset organic to engineer units assigned to the IBCT. It provides the capability to maintain freedom of maneuver through high tactical mobility. The engineers will deploy with REBS forward in support of the three maneuver battalions and the reconnaissance, surveillance, and target acquisition (RSTA) squadron to provide gap-crossing capabilities.

### BASIS OF ISSUE:

4 per IBCT Engineer Company  
5 per Combat Company, Engineer Regiment, Interim Division

LEGACY

INTERIM

OBJECTIVE

---

## Developmental Systems – Mobility

### Standard Robotic System (SRS)



D-7G



T-3



DEUCE

**DESCRIPTION:** The SRS will be a family of common components that can be installed in specified military ground and special-purpose vehicles for teleoperation. The first systems will provide the capability for remote control of basic vehicle operation such as driving, turning, stopping, and controlling dozer blades and tracks. Additional capabilities, such as controlling respective mission payloads (referred to as user functions), mission planning, air droppable versions, and extended operational distances, will be achieved by evolutionary technological upgrades of the baseline system. This will transition robotic technologies in some unmanned ground vehicles (UGV) from limited line of sight (LOS) and teleoperation to extended-range nonline-of-sight (NLOS).

**STATUS:** The system is being developed in phases. Each phase consists of developing a virtual-terminal (VT) kit specific to a piece of equipment. There have been two annexes, or VT variants (D-7 and T-3), approved with another annex (deployable universal combat earthmover [DEUCE]) planned.

**EMPLOYMENT CONCEPT:** The system is employed much as is the host system. The advantage of a VT-equipped system is its ability to operate remotely in a hostile environment. This allows the soldier not to be subjected to hostile fire, mines, or sniper fire.

**BASIS OF ISSUE:** The basis of issue (BOI) for the D-7 variant is 3 per corps engineer wheeled battalion; for the T-3 kit, it is 3 per engineer battalion in an air-assault division; and for the DEUCE VT, it is 3 per engineer battalion in a light corps and division.

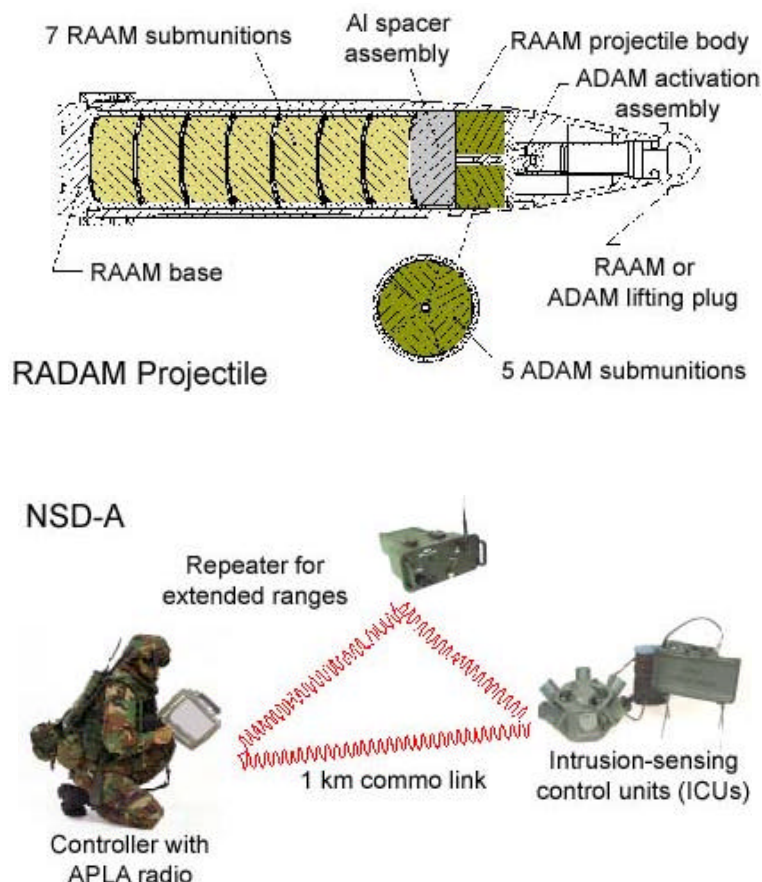
**TRAINING/PERSONNEL:** There is no requirement for a new military occupational specialty (MOS). The United States Army Engineer School (USAES) furnishes training support packages (TSPs) and other related documentation for operational tests and represents the user as the combat developer and trainer. No special training facilities are required. Training materials are fielded with the system (the use of embedded training is desired).

LEGACY

INTERIM

OBJECTIVE

## Antipersonnel Land-Mine Alternative (APLA)



**DESCRIPTION:** Although the United States (US) has not joined the Ottawa Treaty banning antipersonnel (AP) land mines, Presidential guidance is to end the use of AP land mines outside of Korea by 2003, to search for alternatives to both AP land mines and mixed munitions that would provide equivalent military effectiveness, and to minimize risks to noncombatants. Former President Clinton stated that we will join the Ottawa Convention by 2006 if we succeed in fielding suitable alternatives by then. In the interim, we are to retain our mixed antitank (AT)/AP) mine systems.

**LAND-MINE ALTERNATIVES:** Presidential Decision Directive 64 directs the Department of Defense (DOD) to develop alternatives to AP land mines. The directive specifies the development of the Remote Area Denial Artillery Munition (RADAM) and the Non-Self-Destruct Alternative (NSD-A) (both described below) as well as alternative concepts for our mixed AT/AP systems. These alternatives are to have equivalent military effectiveness while minimizing risks to noncombatants.

The RADAM is a mixed system that combines seven remote-antiarmor-mine (RAAM) AT mines and five area-denial-artillery-munition (ADAM) AP mines in one 155 shell. Because of its AP component, this mixed system is not Ottawa compliant. The directive is to develop alternatives to AP land mines to end the use of all pure AP land mines outside of Korea, including those that self-destruct, by 2003 (2006 for Korea). Without RADAM production, tactical commanders will lose their ability to emplace a mixed system during this period. Under the Secretary of Defense (Acquisition, Logistics, and Technology) (USD

## Developmental Systems – Countermobility

[ALT]), the production decision is on hold until new guidance is received from the National Security Council (NSC). Production remains on hold pending the OSD decision.

The NSD-A system relies on a man in the loop to achieve Ottawa compliance. An operator remotely controls grenades and M16 warheads. Operational war-fighter requirements include a target-activated option that is not Ottawa compliant. The operational requirements document (ORD) is approved by the Joint Requirements Oversight Committee. The USD (ALT) decision to enter engineering/manufacturing design is pending NSC policy guidance.

For alternatives to mixed AT/AP systems, six concepts are currently under study. None is likely to be fielded by 2006. All have varying degrees of difficulty in deep and fast-moving operations.

In addition to the programs described above, the Defense Advanced Research Projects Agency (DARPA) is researching the Self-Healing Minefield (SHM). In this concept, minefield breaches would be healed by the remaining mines relocating to close the breach.

LEGACY

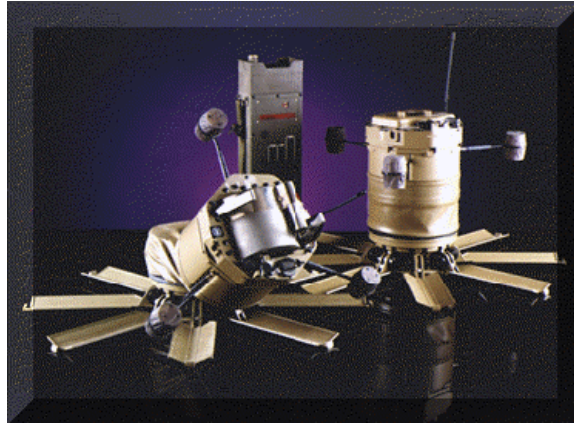
INTERIM

OBJECTIVE

---

## Hornet (Wide-Area Munitions [WAM])

---



**DESCRIPTION:** The Hornet will be developed in two sequential phases:

- Phase One—a hand-emplaced munition (basic Hornet).
- Phase Two—a Hornet product improved with a remote control on/off/on capability (advanced Hornet). (**NOTE: Key component of Raptor.**)

Hornet variants have standoff detection and engagement capabilities. The Hornet detects targets up to 600 meters away and attacks targets from the top at ranges of up to 100 meters, resulting in a mobility or firepower kill. The basic Hornet engages tracked vehicles and may be armed manually or by the M71 Modular Pack Mine System (MOPMS) Remote-Control Unit (RCU). The advanced Hornet will engage tracked and wheeled vehicles and is remotely controlled by the Improved Hornet Control Station, a handheld laptop computer built on Army common hardware. Using this control station, advanced Hornet munitions may be recovered and redeployed before initial arming.

**STATUS:** The Hornet completed a successful live-fire test against a moving T-62 tank on 1 May 1992 and a moving T-72 tank on 11 September 1997. The basic Hornet concluded production qualification testing in December 1999 and is in production. The first-unit-equipped (FUE) date is projected to be 2QFY01. The advanced Hornet entered engineering and manufacturing development in 3QFY96. The FUE date for the advanced Hornet is scheduled for FY04.

**EMPLOYMENT CONCEPT:** The Hornet can be used in offensive and defensive operations, in both a tactical and operational role. In the close battle, combat engineers and maneuver forces under engineer supervision will emplace the Hornet. At extended ranges, special-operations forces (SOFs) and rangers will emplace it. Hornet gauntlets, a series of randomly spaced clusters of six or more munitions, will be employed along high-speed avenues of approach to disrupt and attrite the enemy in column formations. Hornet area-disruption obstacles, consisting of 20 Hornets employed in an "X" pattern across a 1- by 1-kilometer grid square, will disrupt and attrite the enemy as he deploys from prebattle to battle formations before the start of the direct-fire battle. When employed deep, the Hornet will disrupt a threat commander's operational tempo by attacking his follow-on forces, logistics, and command and control or by denying key terrain such as approaches to bridges and river-crossing sites. The Hornet may also be used to attack high-value targets selectively, including tactical-ballistic-missile (TBM) launchers or transporter erector launchers (TELs).

**BASIS OF ISSUE:** The Hornet is a Class V supply item. The Advanced Hornet Control Station is a Class VII supply item. For combat engineers, the projected basis-of-issue plan (BOIP) for the Advanced Hornet Control Station is down to platoon level in light units and down to squad level in heavy units.



## Developmental Systems – Countermobility

For maneuver units, the following BOIP is projected: One control station per maneuver company, one per maneuver battalion headquarters, and one per scout vehicle.

**TRAINING/PERSONNEL:** The United States Army Engineer School (USAES) will provide training on the employment of the Hornet. Individual and collective trainers are being procured to train operator tasks and for force-on-force training.

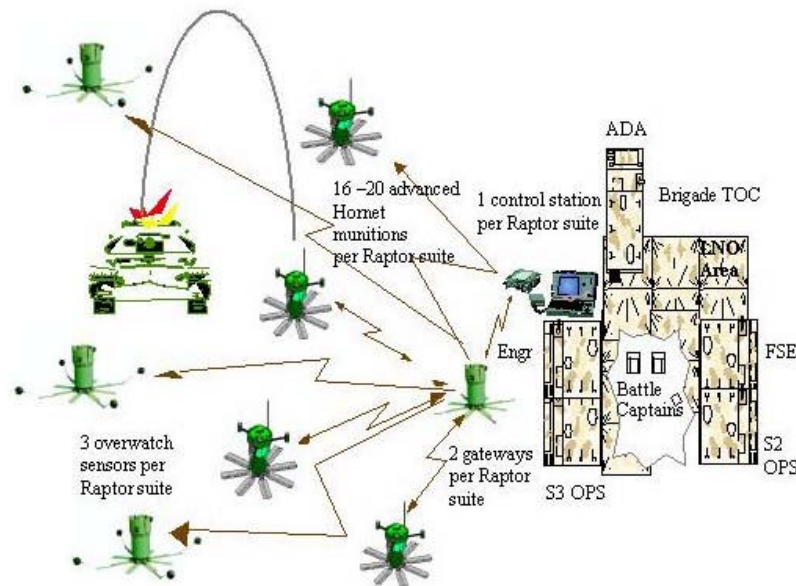
LEGACY

INTERIM

OBJECTIVE

---

## Raptor—Intelligent Combat Outpost



**DESCRIPTION:** The Raptor Intelligent Combat Outpost is a suite of munitions, sensors, communications system, and a control station that enables the commander to protect his battle space. The Raptor will be comprised of advanced overwatch sensors, an artificial intelligence platform (the gateway), a ground control station, and lethal or nonlethal munitions. The current munition of choice is the Advanced Hornet, but future munitions used with Raptor may be designed to provide effects consistent with the situation and the commander's intent. Raptor will be developed in three blocks:

- Core Raptor. Core Raptor will be capable of meeting user threshold requirements (sensors, gateways, ground control station, and munitions).
- Block one. Ultimate Raptor will consist of long-haul communications capability, improved targeting algorithms and artillery (the Advanced Field-Artillery Tactical Data System [AFATDS]) system cueing.
- Block two. Objective Raptor will include advanced integration with blue systems (intelligence, aviation, artillery, and air defense); identification, friend or foe (IFF) capability; and deep delivery. Ultimate Raptor capabilities will be retrofitted onto Core Raptors. The Ultimate Raptor system will have the capability to be used in the following ways:
  - Occupy engagement areas without overwatching fires, guard flanks, or screen a unit's front.
  - Outpost or listening post for combat intelligence gathering.
  - Forward observer, cueing and directing fires (artillery and aerial) on threat targets.

**STATUS:** The Raptor is in the concept-exploration phase of the acquisition cycle. A Milestone (MS) I decision is expected 2QFY01. The scheduled first-unit-equipped (FUE) date for Core Raptor is 4QFY08.

**EMPLOYMENT CONCEPT:** Raptor-controlled munition fields may be hand emplaced or air delivered. Before emplacement, each Raptor-controlled munition is associated with a gateway. When activated by a manned ground control station, each munition is armed and the sensors are activated. When targets enter the field, sensors report the range and bearing estimates of the targets to the gateway where a consolidated view of the entire target array is developed. This information is relayed periodically to the

## Developmental Systems – Countermobility

ground control station for display. When the control-station operator determines the vehicles are hostile and should be engaged, he selects and sends to the gateway an engagement strategy. On receipt, the Raptor-controlled munition field executes the attack command and will autonomously launch an attack against threat vehicles without further human intervention.

**BASIS OF ISSUE:** To be determined (TBD).

**TRAINING/PERSONNEL:** The Raptor shall require a new equipment training (NET) team. The NET team will use the Train-the-Trainer program at the unit level; this training will consist of operation, maintenance, and employment of the Raptor system.

LEGACY

INTERIM

OBJECTIVE

---

## Selectable Lightweight Attack Munition (SLAM), M4

---

**DESCRIPTION:** The M4 SLAM is a hand-emplaced, antimaterial and antivehicle munition. It is a variant of the special forces' developed SLAM. It is light, compact, effective, and readily usable by initial-entry assault-force units to destroy enemy vehicles; parked aircraft; ammunition; and petroleum, oil, and lubricants (POL) sites. The SLAM's explosively formed penetrating warhead can perforate 40 millimeters (mm) of homogeneous steel. The SLAM has four possible methods of detonation—detonation as a mine function, passive infrared (PIR) detonation, command detonation function (blasting cap), and a time-delay function (integral timer).

**STATUS:** During 3QFY95, the Department of the Army (DA) directed that the Army SLAM variant must self-destruct rather than self-neutralize. To achieve this, a Soldier Enhancement Program (SEP) was approved for FY96. Also, on 29 September 1995, the special-operations forces (SOF) required operational capability (ROC) was amended to reflect the Army's self-destruct requirement. The Army SLAM variant is referred to as the M4. Type classification was conducted in June 1996 and the first unit was equipped in 4QFY00.

**EMPLOYMENT CONCEPT:** The M4 SLAM will be used primarily by initial-entry assault forces (light, airborne, and air assault). The SLAM will be used to augment conventional mines and demolitions. It is intended for use against light-armor, wheeled, and tracked support vehicles and small hardened facilities. It will be employed according to the following doctrinal manuals: Field Manual (FM) 5-7-30, *Brigade Engineer and Engineer Company Combat Operation (Airborne, Air Assault, Light)*; FM 20-32, *Mine/Countermine Operations*; FM 5-34, *Engineer Field Data*; and FM 5-250, *Explosives and Demolitions*.

**BASIS OF ISSUE:** This class V item is issued on an as needed basis.

**TRAINING/PERSONNEL:** The United States Army combat and combat-support (CS) schools will provide training during basic and advanced courses of instruction on SLAM employment. At unit level, training will be primarily conducted using the M299 SLAM Training Kit.

LEGACY

INTERIM

OBJECTIVE

---

## Volcano, Trailer-Mounted

---



**DESCRIPTION:** The trailer-mounted Volcano is a downsized system primarily used by the interim brigade combat team (IBCT) to protect the flanks of the maneuver forces as point obstacles. The trailer-mounted Volcano will use a mine-clearing line charge (MICLIC) M200A1 trailer with two racks (40 canisters per rack) and will be towed by an engineer squad vehicle (ESV).

**STATUS:** A trailer-mounted Volcano system will be designed, manufactured, and tested during FY01. Type classification is scheduled for September 2001.

**PROGRAM DOCUMENTATION:** Not applicable.

**ARMY ACQUISITION OBJECTIVE (AAO):** 21.

**FIRST-UNIT-EQUIPPED DATE:** FY02.

**BASIS OF ISSUE:**

- 3 per IBCT
- 3 per combat company, engineer regiment, interim division

LEGACY

INTERIM

OBJECTIVE

---



## High-Mobility Engineer Excavator (HMEE)

---



**DESCRIPTION:** The HMEE is a self-deployable excavation system with attachments to execute a wide range of mobility, countermobility, general engineering, and survivability missions. The base vehicle is equipped with a backhoe and a bucket loader. However, it is capable of operating a variety of attachments such as a forklift, a compactor, and a sweeper. The HMEE can power handheld hydraulic attachments including a hydraulic rock drill, a chain saw, and a picket driver.

**STATUS:** The HMEE is the follow-on program to the small emplacement excavator (SEE) with funding currently programmed to start in FY05. The creation of the interim brigade combat team (IBCT) has expedited the need for the HMEE. To address the needs of the IBCT, a limited number of interim HMEEs will be procured. This is being accomplished through an FY01 Foreign Comparative Test Program leading to selection and fielding in FY03. A separate program will be initiated to procure an HMEE that will serve the needs of the rest of the Army. The HMEE will support medium and heavy units, and a light variant will meet the needs of airborne/air-assault units.

**EMPLOYMENT CONCEPT:** The HMEE will be deployed to construct protective shelters/bunkers and helipads; prepare bivouac sites; and assist with the emplacement of culverts, seaport construction, logistics base operations, and other structures and facilities. When equipped with various attachments, the HMEE can provide combat-deployed units a host of earthmoving and construction-support capabilities.

## Developmental Systems – Survivability

### BASIS OF ISSUE:

<u>TYPE I</u>			<u>TYPE II</u>		
SRC	UNIT	QTY	SRC	UNIT	QTY
05063F	En Co, Bde Cbt Tm	6	05053L	En Co. Lt ACR	6
05113L	En Co, ACR	3	05153L	En Co, Sep Inf Bde	6
05143L	En Co, Hvy Sep Bde (NTC)	3	05026L	HHC, En Bn Abn Div	9
05337L	En Co, En Bn, Hvy Div	2	05027L	En Co, En Bn Abn Div	6
05417L	En Co, Cbt Hvy Bn	2	05156L	HHC, En Bn Inf Bde	18
05423L	En Co, CSE	6	05216L7	HHC, En Bn Air Asslt	9
05427L	En Cbt Co, Corps (Whl)	6	05217L7	En Co, En Bn Air Asslt	6
05434L	Pipeline Construction	3	05443L1	En Co, Lt Equip Abn	6
05437L2/3	En Co, En Bn, C (X)	2	05443L2	En Co, Lt Equip	6
05473L1	En Co, Multirole Bridge	4	05447L1	En Co, Cbt Bn Abn	6
05520L	Quarry Team	2	05447L2	En Co, Cbt Bn Lt	6
05530LH	Utilities Team	1	07035L	En Plt, 3-325 (SETAF)	6
05603L	Port Opening	3	63905L	HQ and Maint Spt Co (Abn)	1
09447L	Ord Co, EOD	1		USAES	24
09484L	Ord Co, Ammo Moads	1		NTC	2
10417L	QM Pet P/L and Tml Op Co	1		JRTC	7
10427L	QM Pet Sup Co	2		USAES	24
10468L	QM Water Sup Co	2		NTC	3
10468L	QM Corps Collection C	2		JRTC	7
19646L4	HHC MP Bn	1			
42424L	QM Force Provider Co	6			
42447L	QM Supply Co	1			
55918L	Trans RW En Co	4			

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62J10-20 or maintainer 63B10-30.

LEGACY

INTERIM

OBJECTIVE

## Digital Topographic Support System (DTSS)— High-Volume Map Production (HVMP)

---



**DESCRIPTION:** The DTSS-HVMP configuration will consist of a high-volume, large-format, deployable, digital printing system mounted in an environmentally controlled, standard Army shelter on a military 5-ton truck. It will be capable of accepting digital or hard-copy information and printing products at a minimum size of 22.5 inches by 29 inches. The HVMP will provide the capability to print color copies with one print pass at a peak production rate of 5,000 copies per day. A paper conditioning and storage van (5-ton) and a distribution van (5-ton) will accompany the configuration to facilitate the storage of map paper and the processing and distribution of products. The HVMP replaces the Topographic Support System (TSS) reproduction subsets and provides support consistent with Force XXI objectives. The DTSS-HVMP will be interoperable with other DTSS configurations and will be capable of receiving and printing their digital files and augmenting their output with high-volume, hard-copy printing capabilities. The HVMP will be fielded at echelons above division (EAD).

**STATUS:** Market investigation was conducted, and the Advanced Concept and Technology II (ACT II) was conducted during FY00. The DTSS-HVMP is in the preplanned product improvement (P3I) paragraph of the approved DTSS operational requirements document (ORD) dated 13 February 1998. The updated DTSS ORD is at the United States Army Training and Doctrine Command (TRADOC) for approval and it includes the DTSS-HVMP.

**EMPLOYMENT CONCEPT:** EAC and corps.

**BASIS OF ISSUE:** 4 per table(s) of organization and equipment (TOE) 05607L and 2 per TOE 05608L. Other system issues will be based on the contingency mission.

LEGACY

INTERIM

OBJECTIVE

---

All-Terrain Crane (ATEC) Pile Driver

---



**DESCRIPTION:** The ATEC Pile-Driving Set will include components required to drive piles including hammers, catwalks, lead sections, and pile extractors. The pile-driving set will be compatible with the ATEC and will be used to drive wood, concrete, H-beams, and steel piles.

**STATUS:** Under development with objective to field 3QFY03.

**EMPLOYMENT CONCEPT:** The ATEC Pile-Driving Set will only be given to specified engineer and support units to perform pile-driving missions.

**BASIS OF ISSUE:**

Engineer Construction-Support Company  
Headquarters Support Company (HSC), Combat-Heavy Battalion  
Combat-Support-Equipment (CSE) Company, Port Opening

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62F10-20 or maintainer 63B10-40.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---

## Deployable Power Generation/Distribution System (DPGDS)

---



**DESCRIPTION:** The DPGDS will generate and distribute utility-grade electrical power in support of military operations. It is an integrated power system that includes generation, high-voltage distribution, control and monitoring, and fuel supply. The 920-kilowatt (kW) unit pictured above is the generation source. It consists of twin 460-kW diesel-engine-driven generator sets mounted in a trailer certified for over-the-road towing. The system will meet environmental emission regulations mandated by the Environmental Protection Agency (EPA).

**STATUS:** Fielding of the system will begin in FY02. It is currently being prepared for a fix verification to resolve deficiencies discovered during the operational test (summer 2000). A Milestone III production decision is expected in September 2001.

**EMPLOYMENT CONCEPT:** The DPGDS will be employed by the 249th Engineer Battalion (Prime Power) to provide highly reliable electrical power in support of war-fighting, stability, support, and disaster-relief operations.

**BASIS OF ISSUE:** Forty-two generators, configured into platoon-level power plants of 4 generators each, will be fielded to the 249th Engineer Battalion. The power plant will include high-voltage distribution, a fuel system, and instrumentation/control systems.

**TRAINING/PERSONNEL:** Personnel holding military occupational specialty (MOS) 52E (Prime-Power Production Specialist) will operate and maintain the DPGDS. No new MOS is required to support the fielding of the DPGDS.

LEGACY

INTERIM

OBJECTIVE

---



Engineer Mission Modules—Water Distributor (EMM-WD)



**DESCRIPTION:** The EMM-WD is a demountable unit capable of repeated use. It comes in two types: Type I is a 2,000-gallon module for use with the Heavy, Expanded Mobility, Tactical Truck Load-Handling System (HEMTT-LHS) and the Palletized Load System (PLS) trailers. The Type II is a 3,000-gallon module for use with the PLS truck and trailer. The EMM-WD's main mission will be to haul water to support fire-fighting teams and to provide compaction for roads and airfields, dust control, and soil stabilization. The EMM-WD can operate in a stand-alone mode as well as on the HEMTT-LHS or PLS truck and trailer. Water is dispensed through a spray bar or a hose provided with the system.

**EMPLOYMENT CONCEPT:** The EMM-WD will replace existing equipment and enhance the engineer corps and supported forces in the areas of combat support (CS), combat service support (CSS), and general construction missions. The Type I EMM-WD is C-130 transportable empty off the HEMTT-LHS and empty off the PLS trailer. The Type II EMM-WD is C-130 transportable empty off the PLS trailer only. The PLS trucks are not C-130 transportable, but HEMTT-LHSs are.

**BASIS OF ISSUE:** Two modules per 6,000-gallon trailer. The Type I EMM-WD will be issued to tactical fire-fighting teams and the headquarters in a modular ammo ordnance company. The Type II EMM-WD will be issued to construction-support companies, combat heavy battalions, combat-support-equipment companies, corps wheeled battalion companies, and quarry teams.

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSSs) will be required to operate/maintain the EMM-WD.

LEGACY

INTERIM

OBJECTIVE

## Floodlight Set (FLS)

---



**DESCRIPTION:** The FLS is a container with high-wattage lights on moveable stands, cables, manuals, tools, and a sustainment package. The FLS container may also be tied down to an appropriate trailer for units without trailer space. The FLS may include associated trailers and power generators, based on the using unit's needs. The floodlight stands will adjust to allow setting the light heights, angles, and distances from darkened work or security areas. Lights must provide suitable lumen levels to allow safe and efficient work or physical security. The FLS container will include light components during storage and transportation.

**STATUS:** There is a new-start program to replace five old light sets having severe electrical safety problems. The draft operational requirements document (ORD) is being staffed worldwide with proposed approval in 3QFY01.

**EMPLOYMENT CONCEPT:** The user erects FLS components and then connects the lights to a generator, a power grid, or a commercial power source. Once the work is completed, the user returns the light components to the FLS container for stowage, storage, or movement to the next work site. Subject-matter experts (SMEs) from security and construction organizations substantiated the need for floodlights in order to conduct standard operations according to doctrine.

**BASIS OF ISSUE:** The basis of issue (BOI) will be determined during the basis-of-issue plan (BOIP) process. Current projected numbers are 3,345 sets in combat-arms, combat-support (CS), and combat-service-support (CSS) units.

**TRAINING/PERSONNEL:** Floodlight users (the military occupational specialty [MOS] is immaterial) and maintainers will be trained in units using the operator and troubleshooting manual with the floodlight set. There will be no institutional or new-equipment training.

LEGACY

INTERIM

OBJECTIVE

---

## Heavy Engineer Crane (HEC)

---



**DESCRIPTION:** The HEC will replace existing 40-ton crawler cranes in port-construction and construction-support companies. Attachments for the crawler crane include a hook-block, a 1/4-cubic-yard clamshell, a dragline, a concrete bucket, a wrecking ball, and 7,000- and 12,000-pound diesel-operated pile drivers. Construction-support companies use the crane to perform lifting, loading, and excavation operations and to support rock-crushing operations.

**STATUS:** The crawler cranes in the inventory have exceeded their 15-year life cycle and are in need of replacement. An operational requirements document (ORD) is being developed to support procurement.

**EMPLOYMENT CONCEPT:** The HEC will be deployed to perform heavy lifting and loading capabilities. Crane attachments will be used to perform pile-driving, clam-shelling, dragline, and wrecking-ball operations and to support concrete-pouring operations.

**BASIS OF ISSUE:** Crawler cranes are authorized in the engineer construction-support company and the port-opening company.

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62F10-20 or maintainer 63B10-40.

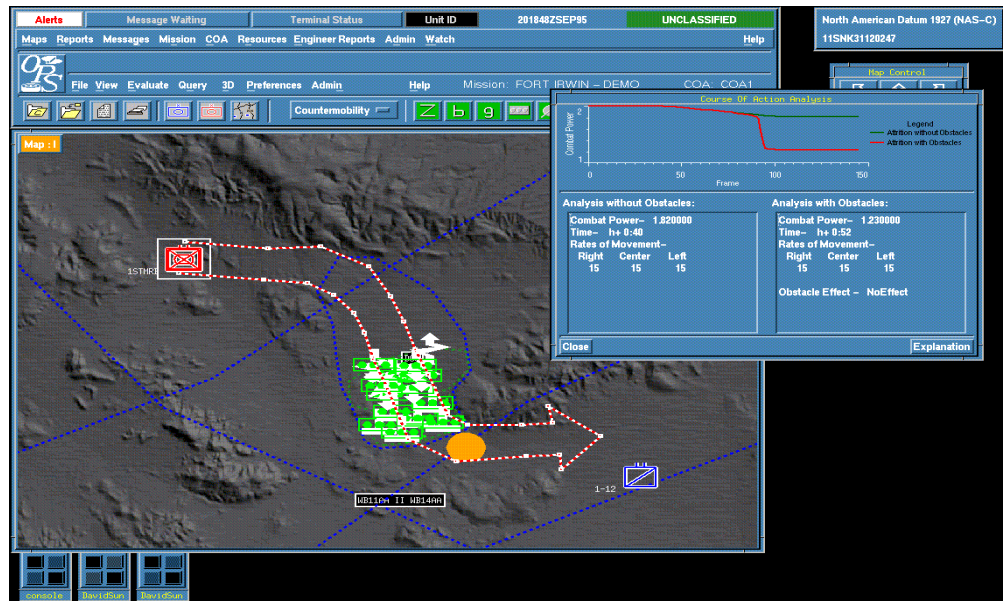
LEGACY

INTERIM

OBJECTIVE

---

## Maneuver Control System—Engineer (MCS-E)



**DESCRIPTION:** The MCS-E is an engineer-specific software system subordinate to the Maneuver Control System (MCS). It is software that will reside on MCS version 12.0+. The system will provide automated command and control to engineer staffs and commanders. MCS-E will operate on the Army Battle Command System (ABCS) common hardware. It will provide engineer information to the MCS and allow engineer access to maneuver data. The MCS is a command and control (C<sup>2</sup>) system that provides the maneuver commander and his staff (corps and below) with automated assistance to execute precise, near-real-time C<sup>2</sup> of combat forces. Organizational personnel in a garrison and/or field environment will operate the MCS-E. Operation will occur in a sheltered or semisheltered environment with the capability of being operated from various power sources. Data will be transferred electronically over a local-area network (LAN)/wide-area network (WAN) through available communications media, using MCS protocols. The basic missions of the system will be inputting, processing, and outputting data to support MCS-E information requirements. The MCS-E automation system will contain an automated interface to the MCS.

**STATUS:** The project manager for Combat Terrain Information Systems (PM-CTIS) is developing the system as part of the obstacle planning system. The PM-CTIS will enhance the Engineer-Obstacle Planning System code and coordinate its integration into the MCS to produce the MCS-E Version 1.0. Early in development, the MCS-E 1.0 is 2 to 3 years away from user test. The United States (US) Army Training and Doctrine Command (TRADOC) approved the operational requirements document (ORD) on 3 June 1993. A tentative fielding schedule is as follows:

- |                                     |                     |
|-------------------------------------|---------------------|
| • 1st Cavalry Division              | 4QFY04              |
| • III Corps                         | 4QFY04              |
| • 82nd Airborne Division            | 4QFY04              |
| • 3d Infantry Division (Mechanized) | 4QFY05              |
| • 2d Infantry Division              | 4QFY05              |
| • 1st Armored Division              | 4QFY05              |
| • Remainder                         | To be decided (TBD) |

## Developmental Systems – General Engineering

**EMPLOYMENT CONCEPT:** The MCS-E software will be distributed to engineer units that support the maneuver corps through brigade headquarters. The plan is to distribute a downsized version for engineer units supporting maneuver battalions through companies. Its use will be limited to digitizing engineer reports and returns and as a part of the Force XXI Battle Command—Brigade and Below (FBCB2) System.

**BASIS OF ISSUE:** The system will be issued to the assistant corps engineer; the assistant division engineer (ADE); the assistant brigade engineer; the Intelligence Officer (US Army) (S2); the Operations and Training Officer (US Army) (S3); and the administrative-logistics engineer company.

**TRAINING/PERSONNEL:** There is no requirement for a new military occupational specialty (MOS). Training on the software will be integrated into officer basic and advanced courses and the Noncommissioned Officers Education System (NCOES). Most of the training will become the using unit's responsibility. An extensive on-line help manual is planned.

LEGACY

INTERIM

OBJECTIVE

---

Self-Load Off-Load Trailer (SLOT)

---

**DESCRIPTION:** The SLOT is a 40-ton capable multifunctional trailer with the capability to self-load/off-load equipment through the use of a self-contained hydraulic system.

**STATUS:** Documentation is currently being constructed for the SLOT. Funding is based on Congress.

**EMPLOYMENT CONCEPT:** The SLOT will be used to transport equipment in engineer units throughout the theater of operations (TO).

**BASIS OF ISSUE:** The SLOT will be fielded to engineer units that have the hydraulic excavator (HYEX).

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSs) will be required to operate and maintain the SLOT. Training will be done at the unit during fielding.

LEGACY

INTERIM

OBJECTIVE

---



## Tactical Fire-Fighting System (TFFS)

---



**A graphic representation, not the actual TFFT**

**DESCRIPTION:** The TFFS will consist of five components—an all-purpose crash rescue/fire-fighting truck (the tactical fire-fighting truck [TFFT]); a heavy, expanded, mobility tactical truck (HEMTT) Load Handling System (LHS), vehicle-mounted; an engineer water mission module having a capacity of at least 2,000 gallons of water; and a trailer hauling a 2,000-gallon water tank (referred to as Type I). The TFFT is a commercial fire-fighting unit mounted on a standard tactical Army-type military vehicle and accompanied by the LHS water module hauling a water trailer. The TFFT will be a standard Army tactical vehicle of sufficient load-carrying capacity to transport a fire-fighting team. It will have, as a minimum, a 1,000-gallon water tank. In the field, the TFFS will be stationed at a temporary tactical airfield; ammunition point; or petroleum, oil, and lubricants (POL) site or it will collocate with a division or corps headquarters.

**STATUS:** A contract was awarded in July 2000 to Pierce as part of an unsolicited bid. The discussions between the government and Pierce center on the type of ancillary equipment and the general layout of the system.

**EMPLOYMENT CONCEPT:** The system consists of a fire truck and an engineer HEMTT-LHS water mission module hauling an additional water trailer. In addition, the system will be issued to ordnance units required to provide fire protection to tactical ammunition points. The TFFT will have a carrying capacity of six crew members.

**BASIS OF ISSUE:** One system will be issued to each fire-fighting detachment.

**TRAINING/PERSONNEL:** There is no requirement for a new military occupational specialty (MOS). The United States Army Engineer School (USAES) furnishes training support packages (TSPs) and other related documentation for operational tests and represents the user as the combat developer and trainer. No special training facilities are required. Training materials will be fielded with the system. (Embedded training may be used, if desired.)

LEGACY

INTERIM

OBJECTIVE

## Tactical Fire-Fighting Truck (TFFT)

---



**A graphic representation, not the actual TFFT**

**DESCRIPTION:** The TFFT will be capable of transporting six crewmembers and associated equipment under worldwide climate conditions in a military environment. The fire truck must be operable and maintainable in climatic conditions—hot, basic, and cold—as described in paragraphs 2-4 and 2-5 of Army Regulation (AR) 70-38. A winterization kit will be authorized for use in cold climates. It will be a diesel-driven, front-wheel-steer, all-wheel-drive truck cab and chassis equipped with a 1,000-gallons-per-minute pump with pump-and-roll capability, a water tank of not less than 1,000 useable gallons, dual foam tanks, and hose and equipment compartments (including preconnected cross lays). The fire truck shall be transportable by highway, rail, marine, and air modes (C-17 or larger). It must be capable of on- and off-road operation and have no less mobility and vehicle performance than the current heavy expanded, mobility, tactical truck (HEMTT). The truck must be capable of worldwide deployment, operating independently or in conjunction with other fire-fighting vehicles. References to the National Fire Protection Association standards are to be used as a guide and not interpreted as doctrine or user operational requirements within a tactical environment, which is the mission for the TFFT.

**STATUS:** The request for proposal was released 1 February 2000. An unsolicited bid was awarded to Pierce in July 2000.

**EMPLOYMENT CONCEPT:** The system consists of a fire truck and an engineer water mission module hauling an additional water trailer. In addition, the system will be issued to ordnance units required to provide fire protection to tactical ammunition points.

**BASIS OF ISSUE:** One system will be issued to each fire-fighting detachment. The TFFT will have a carrying capacity of six crewmembers.

**TRAINING/PERSONNEL:** There is no requirement for a new military occupational specialty (MOS). The United States (US) Army Engineer School (USAES) furnishes training support packages (TSPs) and other related documentation for operational tests and represents the user as the combat developer and trainer. No special training facilities are required. Training materials are fielded with the system. (Embedded training may be used, if desired.)

LEGACY

INTERIM

OBJECTIVE

---

## Woodworking Set (WWS)

Developmental Systems – General Engineering

---



**DESCRIPTION:** The future WWS will be portable toolboxes containing pneumatic nailers, assorted saws (circular, jig, sliding compound miter, reciprocating, and such), drills, and supporting tools.

**STATUS:** There is a new-start program to replace the carpenter's tool kit (trailer mounted), line item number (LIN) T16988. The draft operational requirements document (ORD) is being staffed worldwide with a proposed approval date of 3QFY01.

**EMPLOYMENT CONCEPT:** Woodworking tools are employed by Army carpenters in assigned construction missions.

**BASIS OF ISSUE:** One set is issued to each platoon in a combat-heavy company, corps airborne engineer company, and corps light-engineer company; utility teams; and port-opening teams.

**TRAINING/PERSONNEL:** Military occupational specialty (MOS) 51B carpenters use the WWS tools.

LEGACY

INTERIM

OBJECTIVE

---

**SECTION II**  
**FIELDDED SYSTEMS**

**Part 1. Mobility**



## Aluminum Floating Footbridge

---



**DESCRIPTION:** The footbridge consists of an aluminum treadway supported by aluminum pontoons. The bridge is assembled by feeding successive bays into the stream and connecting them. One set provides up to 472.5 feet of bridge and is normally transported by two 2 1/2-ton trucks and two 2 1/2-ton pole trailers.

**STATUS:** A total of five sets of footbridges are currently in the inventory. Two sets are in the United States (US) Army, Europe (USAREUR) operational stocks, two sets are with the National Guard, and one set is with the US Army Materiel Command (AMC). There are no plans for further procurement of the aluminum floating footbridge.

**EMPLOYMENT CONCEPT:** The aluminum floating footbridge is deployed to provide a rapid means of crossing foot troops in an assault phase of a river-crossing operation.

**BASIS OF ISSUE:** One set is authorized per footbridge team.

**TRAINING/PERSONNEL:** No training is done on the footbridge.

LEGACY

INTERIM

OBJECTIVE

---



## AN/PSS-12 Handheld Portable Mine Detecting Set

---



**DESCRIPTION:** The AN/PSS-12 is a handheld portable mine detector capable of detecting buried metallic objects to include both high- and low-metal-content antitank (AT)- and antipersonnel (AP)-type mines. The mine detector consists of a search head, a handle, a control-box assembly (which includes the processor's module, battery, and controls), a headset, and the interconnecting cables. The mine detector weighs about 8 pounds. The handle can be extended from 19 to 57 inches.

**STATUS:** The AN/PSS-12 is currently fielded.

**EMPLOYMENT CONCEPT:** Soldiers in nearly every military occupational specialty (MOS) throughout the battlefield use handheld detectors. One soldier operates the detector; however, relief operators should be provided during operations longer than 20 minutes. During a sweep operation, the operator identifies a suspected mine by an audio signal in the headset. The spot is marked and another team member probes the marked area for the mine.

**BASIS OF ISSUE:** Handheld mine detectors are issued to all units with requirements for them.

**TRAINING/PERSONNEL:** Service schools provide training on the handheld detectors during basic combat training (BCT) and advanced individual training (AIT). Unit training is accomplished through extension training materials and field training involving the use of inert mines. Service schools integrate collective tasks into soldiers' manuals and the unit Army Training and Evaluation Program.

LEGACY

INTERIM

OBJECTIVE

---



## **Armored Combat Earthmover (ACE), M9**

---



**DESCRIPTION:** The M9 is a highly mobile, armored, combat earthmover. The vehicle hull is a welded and bolted aluminum structure with a two-speed winch capable of a 25,000-pound line pull. A towing pintle and airbrake connections are provided. It is equipped with a unique suspension system that allows the front of the vehicle to be raised, lowered, or tilted to permit dozing, excavating, rough-grading and ditching functions. In addition, the M9 has armor protection against small arms and artillery fragmentation, a smoke-screening capability, and chemical-biological protection for the operator. It is capable of a road speed of 30 miles per hour and is transportable in C-130, C-141, and C5A aircraft.

**STATUS:** A multiphased System Improvement Plan (SIP) is ongoing. The SIP is designed to improve the vehicle's performance, durability, readiness and manpower and personnel integration (MANPRINT) characteristics. Phases 1 through 3 are complete. Phase 3 was completed in late 2000 and included a variety of hydraulic, hull, and suspension improvements. Phase 4 is ongoing. This phase includes a variety of hydraulic, hull, and suspension improvements. As a key Legacy system of the Army transformation, the ACE will likely be recapitalized over the next decade, bringing the vehicles back to a like-new condition and inserting new technology. For more information on the M9ACE/SIP, see <http://www.tacom.army.mil/m9ace>.

**EMPLOYMENT CONCEPT:** The M9 ACE normally will be deployed in division and nondivision combat-engineer units in support of heavy-combat forces. The vehicle will enable engineers to accompany heavy forces (including Abrams main battle tanks and Bradley infantry and cavalry fighting vehicles), both on developed roads and cross-country.

**BASIS OF ISSUE:**

<b><u>SRC</u></b>	<b><u>UNIT</u></b>	<b><u>REQ</u></b>
05113L	Engineer Company, Armored Cavalry Regiment	6
05143L	Engineer Company, Headquarters and Service Battery (HSB)	6
05153L	Engineer Company, Separate Infantry Brigade (SIB)	4
05337F	Engineer Company, Heavy Division (FXXI)	7*
05337L	Engineer Company, Heavy Division (AOE)	7
05437L3	Engineer Company, Corps Mechanized	6
05UNKN	Echelons Above Division Battalion	TBD

\*May change to 4 if units are fielded the Grizzly.

**TRAINING/PERSONNEL:** Institutional training is done at the United States (US) Army Engineer School (USAES) for the operator (military occupational specialty [MOS] 12B) and maintainer (MOS 62B). Training Extension Course tapes and training materials will maintain operator proficiency. The US Army Tank-Automotive and Armaments Command (TACOM) periodically conducts sustainment training as requested and funded by units.

LEGACY

INTERIM

OBJECTIVE

---

## Armored-Vehicle-Launched Bridge (AVLB)

---



**DESCRIPTION:** The AVLB launcher is a standard M60 or M48 tank chassis modified to transport, launch, and retrieve the 60-foot span, military load classification (MLC) 60 AVLB. The tank chassis is modified by removing the turret and weapons, fitting a special basket assembly into the turret well, and welding reinforcement beams to the inside of the hull. Two cupolas (operator and commander) are provided with suitable vision blocks for 360-degree vision around the vehicle. A carrying rack on the hull's rear provides the necessary support for the bridge during transport. The bridge is capable of carrying MLC 60 track loads across a 17.4-meter (57-foot) gap with unprepared abutments and an 18.3-meter (60-foot) gap with prepared abutments. (See Safety of Use Message, Control No. 90-24, dated 161030Z Jun 90, reference crossing of MLC 70 traffic.)

**STATUS:** The AVLB program is currently being considered for upgrades to include the MLC 70 at full span (60 feet) and engine and transmission (as well as hydraulic and electric) improvements.

**EMPLOYMENT CONCEPT:** The AVLB launcher can launch and retrieve the AVLB on slopes up to 15 percent and on side slopes up to 8 percent. System mobility is compatible with the supported combat vehicles. The AVLB travels with maneuvering tank- and mechanized-infantry formations. The assault launcher can launch the bridge without exposing bridge personnel to enemy fire and can retrieve the bridge from either end.

**BASIS OF ISSUE:**

Engineer Company, Armored Cavalry Regiment	6
Engineer Company, Separate Heavy Brigade	6
Engineer Company, Heavy Division	4
Engineer Company, Corps (Mechanized)	4

**TRAINING/PERSONNEL:** The United States (US) Army Engineer School (USAES) provides training on the AVLB during advanced individual training (AIT) for the track vehicle crewman (military occupational specialty [MOS] 12F), the Basic Noncommissioned Officer Course (BNCOC), the Advanced Noncommissioned Officer Course (ANCOC), the Engineer Officer Basic Course (EOBC), and the Engineer Officer Advanced Course (EOAC). At the unit level, training will be conducted on the actual piece of equipment as on-the-job training (OJT). Training Extension Course lessons are also available for refresher training at the unit level.

LEGACY

INTERIM

OBJECTIVE

---

## Bailey Bridge, M2

---



**DESCRIPTION:** The bailey-type panel bridge is a through-truss bridge manually assembled by connecting panels end to end. A roadway is formed by connecting stringers and decking between truss girders. The main girders on each side of the bridge can be assembled in multiple widths and heights to provide added strength and/or length of span. Bridge components can be assembled to form piers that are used as intermediate supports for long spans. The bailey-bridge system is very labor intensive but also very versatile. In some cases, because it can be assembled in multiple heights and widths, it is the only tactical bridge suitable for long spans and heavy loads. The basic bridge set contains enough parts and equipment to install two 80-foot, double-single bridges or one 130-foot, double-double bridge. Using a reinforcement set will enable a unit to construct a triple-truss, single-story bridge (in any length from 100 to 180 feet) for military load classification (MLC) 60 traffic.

**STATUS:** The M2 bailey bridge was fielded in World War II in support of allied forces. There are 256 sets of bailey bridges on hand, 154 being operational stocks in Europe. Efforts to configure and maintain bailey stocks as sets are ongoing. There are no plans for additional procurement.

**EMPLOYMENT CONCEPT:** The primary use of the panel bridge is a temporary line-of-communications bridge (LOCB). It can be used in forward areas to replace assault bridging and the medium girder bridge (MGB). This bridge system can also be assembled as a railway bridge, thus providing a relatively rapid repair capability.

**BASIS OF ISSUE:** Normally 1 or 2 sets are allocated to selected nondivision panel-bridge companies; however, some units may have as many as 15 sets.

**TRAINING/PERSONNEL:** Bailey-bridge training is being conducted during the bridgeman's course for career management field (CMF) 12, the Basic Noncommissioned Officer Course (BNCOC), the Advanced Noncommissioned Officer Course (ANCOC), the Engineer Officer Basic Course (EOBC), and the Engineer Officer Advanced Course (EOAC).

LEGACY

INTERIM

OBJECTIVE

---

## **Bangalore Torpedo, M1A1**

---



**DESCRIPTION:** The M1A1 bangalore torpedo is an antipersonnel (AP)-mine-clearing charge dating back to World War II. It clears a 0.6-meter-wide footpath. The bangalore is effective against AP mines and wire obstacles. Each bangalore section weighs 13 pounds, including 9 pounds of explosive. The bangalore kit consists of ten 5-foot sections.

**STATUS:** The system has been fielded since the 1940s.

**EMPLOYMENT CONCEPT:** The bangalore torpedo is a man-portable device for use by dismounted infantry, engineer, and cavalry soldiers. An individual soldier or a team of two soldiers connects the number of needed sections, then pushes the bangalore through the minefield or wire obstacle before detonating. A nonelectric blasting cap initiates detonation. The system is heavy and cumbersome to handle.

**BASIS OF ISSUE:** The bangalore torpedo is a Class V item stored at ammunition supply points and issued for missions when required.

**TRAINING/PERSONNEL:** Training consists of classroom instruction, dry-run drills, videotapes, and live-fire practice. Unit training is currently conducted but is dependent on range availability and individual commanders' emphasis. Training rarely is conducted against live AP mines.

LEGACY

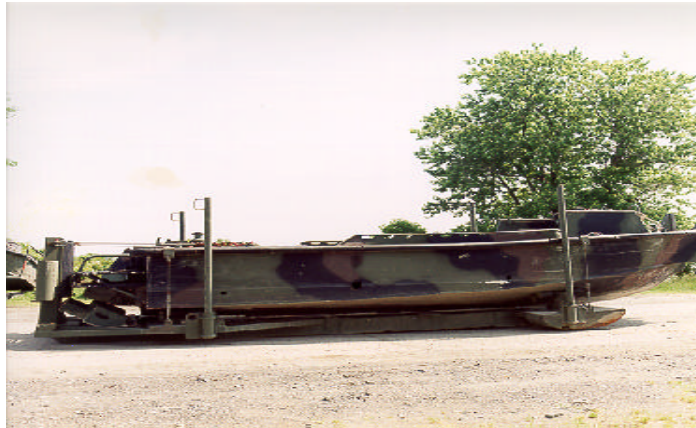
INTERIM

OBJECTIVE

---

## Bridge Erection Boat—Shallow Draft (BEB-SD)

---



### DESCRIPTION:

Line item number (LIN): B25476

National stock number (NSN): 1940-01-105-5728

The BEB-SD is a versatile craft designed to support bridging and amphibious operations, port-construction projects, and other waterborne missions. The 8-meter-long boat has a welded aluminum hull and is powered by two diesel-engine-driven water jets. The BEB-SD is carried on the ribbon-bridge transporter (with cradle) and is capable of being launched or retrieved from the transporter in less than 5 minutes. It is of a shallow-draft design for compatibility with the ribbon-bridge system.

**STATUS:** Seventy-five MK-1 boats and 380 MK-2 boats are fielded in the Army. The United States (US) Army Tank-Automotive and Armaments Command (TACOM) conducted a market survey to investigate upgrading or procuring new technology currently available. A contract was awarded to upgrade two boats with an enclosed heated cab, improved push knees, a power train and jets, added range and depth finders, and a Global Positioning System (GPS). Tests were conducted at Aberdeen Proving Grounds in late 2000 to determine the focus of purchasing new equipment versus upgrading the current equipment; we are awaiting the test results.

**EMPLOYMENT CONCEPT:** The BEB-SD is used primarily as a waterborne erection aid and propelling unit for the ribbon-bridge system. Two boats normally propel a 5-bay raft in currents up to 5 feet per second (fps). Several boats are used to hold a bridge in place. The boat is also used to position anchor cables and bridge-protection devices, to transport components and assembly crews to the far shore, and as a safety boat. The boat may have a secondary mission of supporting diving operations and waterway surveys or serving as a harbor or inland waterway patrol/safety boat.

### BASIS OF ISSUE:

Engineer Bridge Company, Heavy Division  
Engineer Bridge Company, Infantry Division (National Guard)  
Engineer Assault Float-Bridge Company (Ribbon), Corps  
Multirole Bridge Company, Corps Asset



## Fielded Systems – Mobility

**TRAINING/PERSONNEL:** Bridge crewmen (military occupational specialty [MOS] 12C) receive BEB-SD training during ribbon-bridge rafting operations at Fort Leonard Wood, Missouri (one-station unit training [OSUT]). Proficiency is obtained at the unit level.

LEGACY

INTERIM

OBJECTIVE

---

## Common Bridge Transporter (CBT)



**DESCRIPTION:** The CBT is a heavy, expanded, mobility tactical truck (HEMTT) chassis with a load-handling system installed (the same as the Palletized Load System [PLS]). It is able to haul the improved ribbon bridge (IRB), the standard ribbon bridge (SRB), the bridge-erection boats (BEBs), the M2 bailey bridge, the M3 medium-girder bridge (MGB), and the heavy dry-support bridge (HDSB). The adapter interfaces between the truck and the components are the bridge adapter pallet (BAP), the improved boat cradle (IBC), and the PLS flat racks (M1077 and M1). The CBT is capable of transporting a 10-ton load and hauling a loaded 10-ton trailer as well as transloading between the truck and trailer. This type of transporter is a commodity to transportation in the Army.

**STATUS:** The CBT will replace the bridge transporters M945 and M812. The CBT was fielded to the following multirole bridge companies (MRBCs) during 1QFY01:

- Training Base (FLW).
- 459th (USAR).
- 299th (USAR).
- 671st (USAR).
- 652d (USAR).
- 739th (USAR).
- 74th (AC).
- 814th (AC).
- 50th (AC).

The remaining units will be fielded as follows:

<b>FY01</b>	<b>FY02</b>	<b>FY03</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>
502d (AC)	502d (AC)	1437th (NG)	957th (NG)	250th (NG)	167th (NG)
18th (IBCT)	200th (NG)	1438th (NG)	189th (NG)	1041st (NG)	TBD (NG)
				TBD (USAR)	

**EMPLOYMENT CONCEPT:** The CBT provides task-force lead elements with a dependable hauling asset. Its primary mission is to haul bridging assets including ribbon bridges, BEBs, MGBs, and HDSBs.

## Fielded Systems – Mobility

### BASIS OF ISSUE:

Assault Float-Bridge Company, Corps—56 common bridge transporters.  
MRBC, corps asset—56 common bridge transporters.

**TRAINING/PERSONNEL:** Driver skills and training for the transporter and bridging sequence are not significantly greater than that presently required by heavy truck drivers and bridge specialists. Crew-member training for the transporter and bridging sequence was accomplished at initial issue. Officer and noncommissioned officer (NCO) training for the ribbon bridge is conducted during basic and advanced courses. Driver's training and all aspects of ribbon-bridge operation are conducted during advanced individual training (AIT) at Fort Leonard Wood, Missouri.

LEGACY

INTERIM

OBJECTIVE

---

## Engineer Squad Carrier, M113

---



**DESCRIPTION:** The M113 is a lightly armored, full-tracked, air-transportable personnel carrier designed to carry personnel and certain types of cargo. The M113 is the engineer squad vehicle (ESV) in the mechanized force. It will continue to perform this role in those units not slated to receive the Engineer Bradley Fighting Vehicle. The engineer squad carrier is capable of amphibious operations in streams and lakes, extended cross-country travel over rough terrain, and high-speed operation on improved roads and highways.

**STATUS:** Fielded.

LEGACY

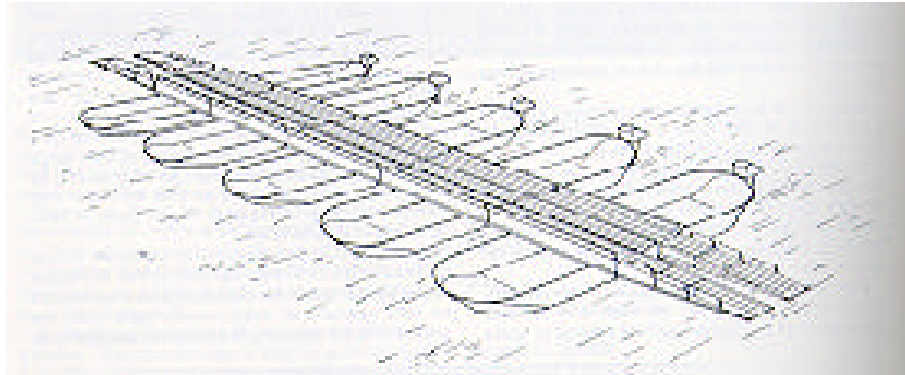
INTERIM

OBJECTIVE

---

## **Light Tactical Raft (LTR)**

---



**DESCRIPTION:** The LTR consists of an aluminum roadway supported by aluminum half pontoons joined at the stern to form whole pontoons. This configuration provides a military load classification (MLC) 16 raft at currents up to 4.3 feet per second (fps). The roadway panels are joined end to end with a pinned connection system. Therefore, two types of end ramps must be used to complete a raft. The raft sets may be connected to form a continuous bridge. Common components allow hand erection and launching of rafts and bridges.

**STATUS:** Of the 99 floating bridges and 89 conversion sets on hand, most are found in reserve-component units or in depots.

**EMPLOYMENT CONCEPT:** The raft/bridge is used in combat areas for wet-gap crossings of light vehicles in support of multiple river crossings or in division operations for the rafting of light vehicles.

**BASIS OF ISSUE:** Four per engineer LTR team.

**TRAINING/PERSONNEL:** No training on the LTR is currently conducted at Fort Leonard Wood, Missouri. The United States (US) Army Engineer School (USAES) has developed exportable training material covering all aspects of the LTR operation.

LEGACY

INTERIM

OBJECTIVE

---

## Medium-Girder Bridge (MGB), M3

---



**DESCRIPTION:** The MGB is a hand-erectable, heavy-duty, prefabricated deck bridge consisting of high-strength components that can be assembled into bridges of varying lengths. The key advantages of the MGB over the bailey bridge are speed and ease of erection. One MGB set contains enough components to construct 102 feet of military load classification (MLC) 60 bridge. With the use of a reinforcement kit and two sets of MGBs, a 160-foot span MLC 60 bridge can be constructed. Although the MGB can withstand MLC 70 loads, the effective life of the bridge is shortened from about 10,000 to 7,000 crossings. The bridge set can also be used to construct a variety of shorter-span bridges.

**STATUS:** The MGB was type classified in February 1973. The Army has fielded 50 sets of MGBs. The Link Reinforcement Set (LRS) was type classified in February 1982. A total of 15 LRSs were procured. The United States (US) Marine Corps has 4 MGB/LRS sets. The MGB will be replaced by the heavy dry support bridge (HDSB).

**EMPLOYMENT CONCEPT:** The rapid construction characteristics of the MGB provide a capability that can be used well forward in the main battle area. Since the Army does not currently have a tactical dry-gap capability longer than 60 feet, the use of the MGB in this role becomes an important operational consideration. The MGB and the bailey bridge are considered as complementary systems, each satisfying different operational requirements. The primary role of the MGB is for tactical bridging in the brigade area while the bailey bridge is used primarily as a lines-of-communication bridge (LOCB). As the tactical situation permits, the MGB would be removed and replaced by the bailey, timber, or steel bridges.

**BASIS OF ISSUE:** The MGB companies are authorized four bridge sets, two bridge-erection sets, and two reinforcement kits. The MGB company is assigned to the engineer brigade (normally one company for each division in the corps).

**TRAINING/PERSONNEL:** Training of the MGB is conducted during military occupational specialty (MOS) 12C advanced individual training (AIT), the Basic Noncommissioned Officer Course (BNCOC), the Advanced Noncommissioned Officer Course (ANCOC), and the Engineer Officer Basic Course (EOBC) at the US Army Engineer School (USAES).

LEGACY

INTERIM

OBJECTIVE

---



## **Mine-Clearing Line Charge (MICLIC), M58**

---



**DESCRIPTION:** The MICLIC is a rocket-projected explosive line charge that provides a "close-in" breaching capability for maneuver forces. It is effective against conventionally fused mines and, when detonated, it provides a lane 8 meters by 100 meters. The MICLIC system consists of an M353 3 1/2-ton or M200A1 2 1/2-ton trailer (or M200 tracked trailer) chassis, a launcher assembly, an M147 firing kit, an M58A3 line charge, and a 5-inch MK22 Mod 4 rocket. The line charge is 350 feet long and contains 5 pounds per linear foot of composition C4 explosive.

**STATUS:** The United States (US) Army approved acquisition of the US Marine Corps' M58A3 trailer-mounted line charge as a nondevelopmental item (NDI) in December 1983. The MICLIC was type classified in August 1985. Fielding to the US Army, Europe (USAREUR) occurred in FY88. Fielding to National Guard units continues.

**EMPLOYMENT CONCEPT:** Engineer units employ the MICLIC in response to minefield breaching requirements identified by the maneuver unit. A typical mission is as follows: The engineer company's MICLIC trailers are moved to a position designated by the maneuver commander, and the line charges are prepared for firing by an engineer squad. Suitable combat vehicles tow the MICLIC trailers to the point of the breach. Movement to the firing site and execution is done under control of the breaching-force commander. A second MICLIC may be fired from the breached lane if a longer breach is required. After firing, the empty trailer is reloaded with another line charge brought forward from the supply trains (if additional breaching missions are anticipated). It may also be towed to a preselected position and dropped for later recovery by support elements.

### **BASIS OF ISSUE:**

- 6 per Engineer Company, Separate Heavy Brigade
- 6 per Engineer Company, Armored Cavalry Regiment
- 4 per Engineer Company, Heavy Division
- 4 per Engineer Company, National Guard Division
- 4 per Engineer Company, Corps (Mechanized Battalion)
- 4 per Engineer Company, Corps (Wheeled Battalion)
- 2 per Engineer Company, Separate Infantry Brigade
- 2 per Engineer Company, Corps (Light Battalion)
- 2 per Engineer Company, Corps (Airborne Battalion)
- 2 per Engineer Company, Air-Assault Division

**TRAINING/PERSONNEL:** Training for the MICLIC is conducted through service schools, technical manuals (TMs), Training Extension Course tapes, the Army Training and Evaluation Program, and unit training. All combat-arms officer and noncommissioned officer (NCO) courses include MICLIC employment considerations in obstacle-breaching instruction. An inert M68A2 line charge is used for training. An improved MICLIC trainer is nearing completion. It will allow inert training on more installations due to a smaller range fan. A light trainer has been approved for garrison training. Local construction instructions are available through the US Army Engineer School (USAES) at DSN 676-7637.

LEGACY

INTERIM

OBJECTIVE

---

## **Pipe Fascines System (PFS)**

---



**DESCRIPTION:** The PFS consists of bundles of 8-inch diameter, high-density plastic pipes chained together and used to fill gaps, trenches, and such as expedient gap-crossing material. The PFS comes in two sizes, mini and maxi. The minisystem is used for smaller ditches and gullies and consists of six pipes forming a 0.7-meter-diameter bundle. It weighs 375 pounds. The maxisystem is used for larger gaps (30 feet) and consists of 75 pipes forming a 2.2-meter-diameter bundle. It weighs 2.8 tons. Both systems are 4.6 meters long and will support up to 70 tons.

**STATUS:** The PFS was approved by Headquarters, Department of the Army (HQDA) for classification as Class IV construction material. The United States (US) Army Tank-Automotive and Armaments Command (TACOM) is filling the requisitions.

**EMPLOYMENT CONCEPT:** Standard breaching drills for small gaps (2.7 to 18 meters). The PFS launch times are less than half those of the armored vehicle-launched bridge (AVLB). The maxisystem is initially towed by another vehicle, then transloaded to an AVLB after bridge or armored vehicle-launched mine-clearing line charges (MICLIC) are emplaced.

**BASIS OF ISSUE:** Engineer battalion's primary agent for procurement and deployment of PFS. Submit requisitions through normal supply channels. The maxisystem's national stock number (NSN) is 4710-99-772-1833. The minisystem's NSN is 4710-99-772-1832.

**TRAINING/PERSONNEL:** No special training is conducted. Units will employ the tactics and techniques in Field Manual (FM) 90-13-1.

LEGACY

INTERIM

OBJECTIVE

---

## Ribbon Bridge

---



**DESCRIPTION:** The ribbon bridge is a modular, aluminum-alloy, and continuous floating bridge system consisting of interior and ramp bays that are transported, launched, and retrieved by a transporter/launcher vehicle. Bridge bays, which are carried in a folded position, automatically open upon entering the water to form a 22-foot section of bridge. Under certain raft/bridge designs and slower current velocities, the M1 Abrams tank can cross the ribbon bridge. Consult Field Manual (FM) 5-34, *Engineer Field Data*, for crossing specifics.

**STATUS:** Ribbon bridge procurement is complete. An improved ribbon bridge (IRB) is in production. Testing for the IRB will begin in 4QFY01. The IRB will increase military load classification (MLC) ratings, increase ramp length, and allow for bank heights up to 2 meters.

**EMPLOYMENT CONCEPT:** The ribbon bridge provides task force (TF) lead elements with a dependable wet-gap bridging capability that can be emplaced rapidly under all conditions. It facilitates the forward movement across wet-gap barriers of wheeled and tracked vehicles in support of ground combat troops. The bridge system accompanies armored, mechanized, and motorized units and provides wet-gap bridging as required. The bridge bays and ramps are also helicopter transportable.

### **BASIS OF ISSUE:**

Assault Float Bridge Company, Corps: 30 interior bays, 12 ramp bays, 56 5-ton transporters  
 Multirole Bridge Company, Corps Asset, 30 interior bays, 12 ramp bays, 56 common bridge transporters

**TRAINING/PERSONNEL:** Driver skills and training for the transporter and bridging sequence are not significantly greater than that presently required by heavy truck drivers and bridge specialists. Training of crewmembers for the transporter and bridging sequence was accomplished at initial issue. Officer and noncommissioned officer (NCO) training for the ribbon bridge is conducted during basic and advanced courses. Driver's training and all aspects of ribbon-bridge operation is conducted during military occupational specialty (MOS) 12C advanced individual training (AIT) at Fort Leonard Wood, Missouri.

LEGACY

INTERIM

OBJECTIVE

---

### Wolverine

---



#### DESCRIPTION:

Nomenclature: XM104

Line item number (LIN): H82510

National stock number (NSN): 5420-01-430-4227

The Wolverine bridges the gaps. It has the following characteristics:

- Upgraded M1A2 System Enhancement Package (SEP) chassis.
  - Pulse-jet air cleaner.
  - Battlefield override.
  - Nuclear, biological, and chemical (NBC) over pressure system.
- 26-meter, military load classification (MLC) 70 bridge.
- M1A2 SEP vetronics.
- Force XXI Battle Command—Brigade and Below (FBCB2) software via appliqué.
- Commercial (modified) launch power unit.
- 1553 data bus.
- No hydraulics or cables on bridge.
- Driver night vision (AN/VVS-2[V]2A).
- Reliability, availability, and maintainability equal to M1A2 SEP fleet.
- Survivability equal to the M1A2 SEP fleet.
  - Horizontal launch reduces visual and radar detection.
  - Better crew protection from enemy fire.
  - Automated fire extinguishing system
  - No crew exposure during bridge retrieval.

**CURRENT STATUS:** The Program Budget Decision (PBD) 745 issued by the Office of Secretary of Defense (OSD) on 27 December 1999 defunded the Wolverine program. This decision was not reached easily and was driven solely by fiscal pressures due to changing priorities necessitated by the Army transformation envisioned by the Army Vision. Since PBD 745, all FY00 funding was restored. The program is pending final review from the OSD for release of remaining FY01 funds.

The Wolverine received its conditional material release on 18 December 2000. The Wolverine is in the low-rate-initial-production (LRIP) phase and began fielding this year (2001). The first unit equipped (FUE) is the 588th Engineer Battalion at Fort Hood, Texas. The FUE date was 1 February 2001. The 588th Engineer Battalion signed for 13 systems.

**STATUS:** The program is currently planning for the 03-07 Mini Program Objective Memorandum (POM). Successful integration into the Mini POM will keep the Wolverine program progressing through the acquisition life cycle. The Wolverine is preparing for additional reliability, availability, and maintainability (RAM) testing, and the initial operational test and evaluation (IOT&E) is scheduled for February through April 2002. With completed RAM testing and a successful IOT&E, the Wolverine will be ready to enter the Milestone (MS) III decision and begin full-rate production.

Currently, the scheduled Wolverine production count is 35 vehicles—6 pilot vehicles and 29 production systems under low-rate initial production (LRIP) contract. The prime contractor is General Dynamics Land Systems, Sterling Heights, Michigan. Their bridge subcontractor is MAN GHH, Weisbaden, Germany.

The Wolverine will participate in the 4th Infantry Division (4ID) Division Capstone Exercise at the National Training Center (NTC) in April 2002.

**EMPLOYMENT CONCEPT:** The Wolverine is employed as an integral part of the M1A2 SEP/M2A3-equipped digital maneuver-battalion task force (TF). The Wolverine, as part of the breaching force and supported by friendly direct and indirect fires, will provide a 24-meter, one-way gap-crossing capability for MLC 70 normal crossing loads with minimal preparation and with little or no loss of TF momentum.

**BASIS OF ISSUE:** The Army acquisition objective (AAO) is to be determined (TBD). The Army procurement objective (APO) is TBD. The basis-of-issue plan (BOIP) is 12 per engineer battalion heavy division and corps (M), 6 per engineer company, armored combat regiment and SEP brigade, and 3 per armored combat regiment squadron.

**TRAINING/PERSONNEL:** Following Department of the Army (DA) approval to complete fielding of the Wolverine to the force, appropriate entry military occupational specialty (MOS), officer, and noncommissioned officer (NCO) institutional courses will be adjusted to reflect changes to doctrinal and employment concepts. Institutional and unit training to qualify operators and maintainers will use training aids, devices, simulations, and simulators (TADSS), including the actual vehicles. Unit sustainment training will supplement and reinforce the skills learned in the institutional course. Embedded training will be a preplanned product improvement (P3I).

LEGACY

INTERIM

OBJECTIVE

---

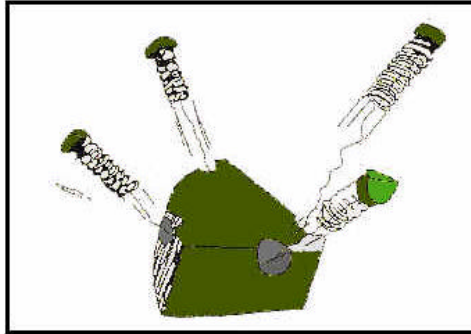


**Notes**

**SECTION II**

**FIELDDED SYSTEMS**

**Part 2. Countermobility**



## **Antipersonnel (AP) Mines; M14, M16, and M18**

---



M14



M16



M18A1

**DESCRIPTION:** The M14 is a nonmetallic, blast-type AP mine consisting of a main charge of tetryl (1 ounce). The mine is cylindrical in shape,  $2 \frac{3}{16}$  inches in diameter, and  $1 \frac{9}{16}$  inches high and weighs about  $3 \frac{1}{2}$  pounds.

The M16 is a bounding-fragmentation-type mine consisting of a mine fuse, a propelling charge, and a projectile in a sheet-metal case. The mine is about 4 inches in diameter, is  $7 \frac{5}{8}$  inches in height with the fuse installed, and weighs  $7 \frac{7}{8}$  pounds. Pressure of between 8 and 20 pounds acting on one or more of the three prongs of the fuse, or pull of between 3 and 10 pounds on a trip wire attached to the release, will activate the mine.

The M18A1 claymore is a directional fragmentation mine that is  $8 \frac{1}{2}$  inches long,  $1 \frac{3}{8}$  inches wide,  $3 \frac{1}{4}$  inches high, and weighs  $3 \frac{1}{2}$  pounds. The mine contains 700 steel spheres (10.5 grains) and a  $1 \frac{1}{2}$ -pound layer of composition C4 explosive. The mine can be initiated by a No. 2 electric blasting cap or a modernized demolition initiator (MDI).

**STATUS:** The M14 was fielded in the early 1950s and last procured in 1974. The M16 and M18 were fielded in the early 1960s. Sufficient mine assets are available to support requirements. There are no plans to purchase additional quantities of these AP mines.

**EMPLOYMENT CONCEPT:** The M14 and M16 AP mines are used with other natural and artificial obstacles to increase obstacle effectiveness. They are also used in standard-pattern minefields to protect against breaching of antitank (AT) mines or by themselves to defeat and demoralize dismounted personnel. They are used to block the most likely enemy approaches, protect a flank, or keep the enemy from key terrain. The M18 command-detonated mine may be used with obstacles or on the approaches, forward edges, flanks, and rear edges of protective minefields as close-in protection against a dismounted infantry attack.

## Fielded Systems – Countermobility

**BASIS OF ISSUE:** The AP mines are Class V items of issue. Combat and combat-support (CS) units may be authorized a basic load of AP mines contingent upon their mission. Combat-engineer units will draw from prestock points or ammunition transfer points as needed for the development and execution of the obstacle plan.

**TRAINING/PERSONNEL:** Initial training is taught at all combat and CS schools. Inert practice mines are used to teach the required skills of emplacing, recognizing, and removing mines. Soldiers maintain mine-laying proficiency through unit training using soldier's manual standards.

**NOTE: United States (US) policy regarding the use and employment of AP land mines is subject to the convention on Certain Conventional Weapons and Executive Orders. Current US policy limits the use of non-self-destructing AP land mines to (1) defending the US and its allies from armed aggression across the Korean demilitarized zone and (2) training personnel engaged in demining and countermining operations. The use of the M18A1 claymore in the command-detonation mode is not restricted under international law or Executive Order.**

LEGACY

INTERIM

OBJECTIVE

---

Antitank (AT) Mines; M15, M19, and M21



M15



M19



M21

**DESCRIPTION:** The M15 AT mine is 13 1/8 inches in diameter, 4 7/8 inches high, and weighs 30 pounds with 22 pounds of high explosives. The mine is a track-breaker and is activated by 350 pounds of pressure. The M19 AT mine is a nonmetallic square mine, 13.09 inches by 13.09 inches by 2.95 inches. The mine weighs 28 pounds with 21 pounds of high explosives. The mine is activated by 400 pounds of pressure and is a track breaker. The M21 AT mine is 9 inches in diameter and 4 1/2 inches high. It weighs 17 pounds with 11 pounds of high explosives. The mine is activated by 4 pounds of pressure against a 21-inch-long extension rod or, without rod, by 290 pounds of vertical pressure on top of the M607 fuse. It uses a Miznay-Schradin plate for a kill mechanism providing belly-kill and track-breaking capabilities.

**STATUS:** The M15, M19, and M21 AT mines were last procured in FY52, FY58, and FY62, respectively. The M15's case, fuse well, and explosive charge have deteriorated, and a rehabilitation program is underway to upgrade the stockpile. No procurement actions are pending.

**EMPLOYMENT CONCEPT:** AT mines are employed in protective, tactical, point, and interdiction minefields. They can be buried by hand or mechanically or can be surface-emplaced. Only the M15 AT mine can be emplaced with the M57 Antitank Mine Dispensing System. An accurate record of the number of mines laid and their exact location is maintained. Authorizing the employment of the mines is the responsibility of the commander whose area is directly affected by the mines.

**BASIS OF ISSUE:** AT mines are Class V items of issue. Combat and combat-support units may be authorized a basic load of AT mines contingent upon their mission. Combat-engineer units will draw from prestock points or ammunition transfer points as needed for the development and execution of the obstacle plan.

**TRAINING/PERSONNEL:** Initial training is taught at all combat and combat-support schools. Inert practice mines are used to teach the required skills of emplacing, recognizing, and removing mines. Soldiers maintain mine-laying proficiency through unit training, using soldier's manual standards.

LEGACY

INTERIM

OBJECTIVE

## Fuse, M624

---

**DESCRIPTION:** The M624 fuse is a standard M607 tilt-rod fuse adapted to fit in the M15 mine. The M624 fuse provides the M15 mine a full-width attack capability.

**STATUS:** The total production target was met during 4QFY87, and the fuse was fielded in Germany and Korea during 1QFY88.

**EMPLOYMENT CONCEPT:** The M624 fuses are packaged with three fuses and five tilt rods in a standard small-arms-type steel box. All or part of a minefield may be emplaced with the M624 fuse. The two extra tilt rods can be used for phony minefields or other deception measures.

**BASIS OF ISSUE:** The M624 is a Class V item drawn as needed to satisfy basic load and mission requirements.

**TRAINING/PERSONNEL:** Training on the M607 fuse for the M21 mine is already conducted for military occupational specialty (MOS) 12B10 and 11B10 personnel. The M624 fuse is identical except for its adapter ring.

LEGACY

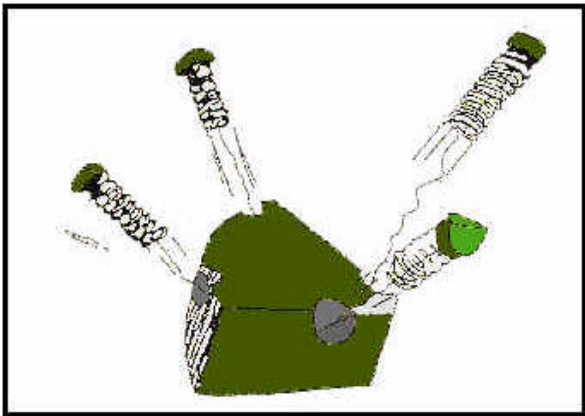
INTERIM

OBJECTIVE

---



Pursuit-Deterrent Munition (PDM)



**DESCRIPTION:** The PDM is a manually activated, area denial artillery munition (ADAM) with a hand-grenade-type-release firing mechanism. It deploys up to seven trip wires and possesses the ADAM’s self-destruct capabilities. For safety purposes, arming will occur one minute after the firing mechanism is released.

**STATUS:** This system is fielded.

**EMPLOYMENT CONCEPT:** The PDM is employed primarily by special-operations forces (SOFs) to support hit-and-run, ambush, harassing, and urban-warfare missions. The PDM is also employed by infantry units, light-combat engineers, and rangers where the mission warrants its use.

**BASIS OF ISSUE:** The PDM is issued as a Class V item of ammunition.

**TRAINING/PERSONNEL:** A training support package (TSP) for the PDM is being developed. Since the PDM is used primarily by special-forces personnel, extensive training is not required.

LEGACY

INTERIM

OBJECTIVE

## Family of Scatterable Mines (FASCAM) Characteristics

**DESCRIPTION:** Scatterable mines (SCATMINES) are laid without regard to a classical pattern. They are designed to be delivered or dispensed remotely by aircraft, artillery, missile, or a ground dispenser. All United States (US) SCATMINES have a limited active life and self-destruct (SD) after that life has expired. The duration of the active life varies with the type of mine and the delivery system.

Most US SCATMINES have similar characteristics (see the following tables). The SCATMINES are much smaller in size and weight than conventional mines. For example, a standard AT SCATMINE weighs about 1.8 kilograms and has 600 grams of explosive; an M15 conventional mine weighs 13.5 kilograms and has 10 kilograms of explosive. Arming mechanisms, arming times, and SD times of SCATMINES differ based on the dispensing system.

**Characteristics of AP SCATMINES**

Munition	Delivery System	DODIC	Arming Time	Fuse	Warhead	AHD	SD Time	Explosive Weight	Munition Weight	Number of Mines
M67	155-mm artillery (ADAM)	D502	45 sec 2 min	Trip wire	Bounding frag	20%	4 hr	21 g Comp A5	540 g	36 per M731 projectile
M72	155-mm artillery (ADAM)	D501	45 sec 2 min	Trip wire	Bounding frag	20%	48 hr	21 g Comp A5	540 g	36 per M692 projectile
M74	Flipper	K151	45 min	Trip wire	Blast frag	20%	5 days 15 days	540 g Comp B4	1.44 kg	5 per sleeve
BLU 92/B	USAF (Gator)	K291 K292 K293	2 min	Trip wire	Blast frag	100%	4 hr 48 hr 15 days	540 g Comp B4	1.44 kg	22 per CBU 89/B dispenser
M77	MOPMS	K022	2 min	Trip wire	Blast frag	0%	4 hr (recycle up to 3 times)	540 g Comp B4	1.44 kg	4 per M131 dispenser
Volcano	Ground/air	K045	4 min	Trip wire	Blast frag	0%	4 hr 48 hr 15 days	540 g Comp B4	1.44 kg	1 per M87 canister

**Characteristics of AT SCATMINES**

Mine	Delivery System	DODIC	Arming Time	Fuse	Warhead	AHD	SD Time	Explosive Weight	Mine Weight	Number of Mines
M73	155-mm artillery (RAAM)	D503	45 sec 2 min	Magnetic	M-S plate	20%	48 hr	585 g RDX	1.7 kg	9 per M718 projectile
M70	155-mm artillery (RAAM)	D509	45 sec 2 min	Magnetic	M-S plate	20%	4 hr	585 g RDX	1.7 kg	9 per M741 projectile
M75	Flipper	K184	45 min	Magnetic	M-S plate	20%	5 days 15 days	585 g RDX	1.7 kg	5 per sleeve
BLU 91/B	USAF (Gator)	K291 K292 K293	2 min	Magnetic	M-S plate	NA	4 hr 48 hr 15 days	585 g RDX	1.7 g	72 per CBU 89/B dispenser
M76	MOPMS	K022	2 min	Magnetic	M-S plate	NA	4 hr (recycle up to 3 times)	585 g RDX	1.7 kg	17 per M131 dispenser
Volcano	Ground/air	K045	2 min 30 sec	Magnetic	M-S plate	NA	4 hr 48 hr 15 days	585 g RDX	1.7 kg	5 per M87 canister, 6 per M87A1 canister

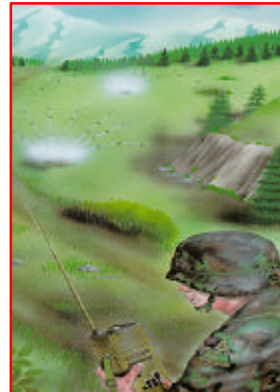
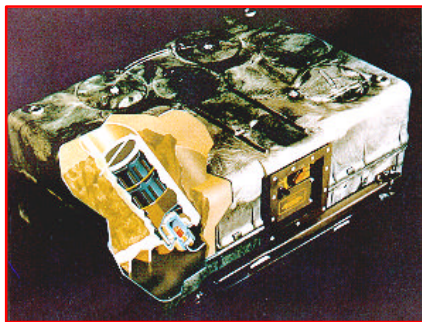
LEGACY

INTERIM

OBJECTIVE

## **Modular-Pack Mine System (MOPMS)**

---



**DESCRIPTION:** The MOPMS is a man-portable antitank (AT) and antipersonnel (AP) mine system. The M131 module weighs about 165 pounds and contains a mix of 17 M78 AT mines and 4 M77 AP mines. This module is stored, shipped, and emplaced without any modification to the container. The MOPMS module may be initiated by hard wire or radio control. The hard-wire capability uses currently available wire and electrical firing devices. The M71 handheld remote-control unit (RCU) allows one individual to control as many as 15 groups of MOPMS modules from a remote location. The AT mine has a magnetic influence fuse and a Miznay-Schardin kill mechanism. The AP mines deploy four trip wires upon ejection that initiate a fragmenting kill mechanism. Both the AP and AT mines contain a radio-frequency receiver that allows the mines to be remotely controlled (recycle self-destruct time and command-destruct) with the RCU once the mines are dispensed. The factory-set self-destruct time is four hours.

**STATUS:** MOPMS fielding is completed. The United States (US) Army Engineer School (USAES) was the first unit equipped on 6 March 1992.

**EMPLOYMENT CONCEPT:** The MOPMS will be employed to close lanes and gaps in minefields and chokepoints, to reinforce obstacles, to emplace point minefields, and for protective mining. Infantry, armor, engineer and other units with a protective mining mission will employ the MOPMS in support of their tactical missions in all areas of the battlefield. If the mines are not dispensed from the MOPMS module, they may be recovered and reused.

**BASIS OF ISSUE:** The MOPMS is a Class V item of issue and will be issued to those units that are authorized a basic load of mines. It will be substituted for conventional mines currently in a unit's basic load. The M71 RCU will be a table of organization and equipment (TOE) item issued to engineer companies (four RCUs to each); armor, infantry, and cavalry companies (two RCUs to each); and other selected companies with a protective mining mission (one RCU to each).

**TRAINING/PERSONNEL:** The USAES will provide training during basic and advanced courses of instruction on MOPMS employment. At the unit level, training will be primarily conducted using the M136 training dispenser and the M71 RCU.

LEGACY

INTERIM

OBJECTIVE

---

## Volcano Multiple-Delivery Mine System

---



**DESCRIPTION:** The Volcano system can be configured as a heliborne or ground-delivered mine system. The M139 mine dispenser, with various adapter kits, is capable of being mounted on UH-60 helicopters and a variety of ground vehicles. These vehicles include all 5-ton trucks and the M548. Adapting kits to mount the M139 to the 5-ton family of tactical vehicles was fielded in FY01. Work is currently underway to fit Volcano pieces to various smaller rolling stock as well for the interim brigade combat team (IBCT) and the light forces. The dispenser racks accept and launch mines from the M87 and M87A1 mine canisters. The M87 canisters each contain five Gator-type antitank (AT) mines and one antipersonnel (AP) mine. An M87A1 canister load is also fielded containing six AT mines and no AP mines.

**STATUS:** The fielding of Volcano systems is completed, with the last M139 dispenser coming from the manufacturer in February 2001 and shipped to the receiving unit. Product improvements programmed for FY02 will include research and development (R&D) for the new dispenser control unit (DCU) Product Improvement Program (PIP). Prototypes for the Volcano mounted on an M200 trailer to support the IBCT are being constructed beginning in February 2001.

**EMPLOYMENT CONCEPT:** The Volcano is employed offensively and defensively as point minefields and as deliberate minefields to delay enemy movement, isolate the battlefield, protect flanks, and reinforce friendly fires. The Volcano has become the standard helicopter mine-dispensing system and has replaced the M56 system, which is declared obsolete. The Volcano has replaced the M56 Ground-Emplaced Mine-Scattering System (GEMSS). This system has a capacity of up to 960 mines per load and is capable of producing a mined area about 1,150 meters by 125 meters. The Volcano's responsiveness is limited only by the crew's ability to load the dispenser (about 30 minutes) and the vehicle's speed in traveling to and traversing the area to be mined. The air Volcano dispenses its full payload in 17 seconds at speeds of up to 120 knots.

**BASIS OF ISSUE:** The Volcano mine dispenser is issued to selected assault helicopter companies at three per assigned aviation company (only one company per division, corps, and/or armored cavalry regiment). The Volcano is also issued at two per combat engineer company, airborne and light, and six per headquarters and headquarters company (HHC), airborne/air-assault division engineer battalion.

**TRAINING/PERSONNEL:** The M88 practice mine canister (which expels six inert mines) and the M89 inert training canister (concrete filled) are the Volcano training devices. A field reloadable training canister is being developed. The Volcano's operation requires no special skills and a designated rather than dedicated operator will be used. Resident training will be for familiarization only. Semiannual operator refreshers in the unit are expected to be sufficient to maintain proficiency.

LEGACY

INTERIM

OBJECTIVE

## **Fielded Systems – Countermobility (FASCAM)**

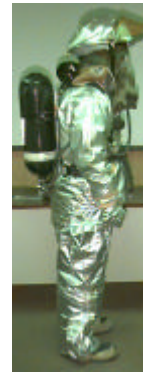
### **Notes**



**SECTION II**

**FIELDDED SYSTEMS**

**Part 3. Survivability**





**Improved Body Armor Set, Individual Countermine (BASIC),  
Preplanned Product Improvement (P3I)  
(Also Known as Improved-BASIC [I-BASIC])**

---



**DESCRIPTION:** The BASIC P3I or I-BASIC is a protective ensemble intended to reduce deaths and debilitating injuries resulting from blast and fragmentation of antipersonnel (AP) mines and booby traps. The set consists of full-face protection, chaps, an over vest (to be worn over the Personnel Armor System for Ground Troops [PASGT]/Interceptor vest), a ballistic collar, a helmet cover, arm protection, and blast overboots. It provides a higher level of ballistic protection than the original BASIC. It supplements the PASGT standard helmet and vest. The BASIC P3I is a follow-on accelerated product improvement of the BASIC program. The BASIC P3I is scheduled for fielding in FY01.

**STATUS:** The United States (US) Army Engineer School (USAES) prepared a requirements memorandum based on Natick's analysis. A design review conducted 14 September 1994 concluded that requiring the ensemble to defeat the VAL69 AP mine completely would exceed the weight-carrying capability of the 5th to 95th percentile soldier. Consequently, a joint decision was made to prioritize protection levels to various areas on the body.

Low-rate-of-production authority has been awarded to place suits into the countermine contingency stock (CMCS). The production decision/material release should be awarded, and fielding will begin in FY01.

**EMPLOYMENT CONCEPT:** The BASIC P3I is intended to protect troops involved in deliberate sweeping/clearing operations. Due to the weight of the suit and the thermal stress on the body, it should not be employed as an assault uniform. Commanders will have the latitude to use the suit based on the mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC). Because of the weight involved, there is significant risk of neck injury if the armored helmet/visor assembly is worn during any movement other than during countermine-detection operations.

**BASIS OF ISSUE:** Legacy BASIC is currently authorized in Common Table of Allowances (CTA) 50-900 as organizational equipment. The BASIC P3I is scheduled for issue to company-level combat engineers. Some sets will be sent to selected combat-heavy engineers. Other units assigned to missions that anticipate the need for BASIC P3I suits may draw them from the CMCS. Nonengineer units with mine detectors in their modified tables of organization and equipment (MTOE) are authorized, but not required, two suits per detector. Quantities are limited. There are currently five persons in a doctrinal detection team.

**TRAINING/PERSONNEL:** Service schools will provide familiarization training during advanced individual training (AIT).

LEGACY

INTERIM

OBJECTIVE

---

## **Joint-Firefighter Integrated Response Ensemble (J-FIRE)**

---



**DESCRIPTION:** The J-FIRE will enable firefighters to perform fire-fighting and rescue duties while in a chemical/biological (CB) warfare environment. The ensemble will consist of a two-piece CB protective suit with an integral hood, firefighter's protective equipment (FPE), and an Interspiro self-contained breathing apparatus (SCBA) with an Interspiro chemical-warfare mask.

**STATUS:** The J-FIRE's developmental testing and evaluation was conducted at two Air Force installations and two Army installations during 2QFY96. Operational testing and evaluation was conducted 3QFY96, at Nellis Air Force Base, Nevada. A final glove acceptance test was conducted at the Army Reserve Center in January 2000. The system is type classified and being issued.

**EMPLOYMENT CONCEPT:** The CB suit will be worn by firefighters (military occupational specialty [MOS] 51M) whenever there is a threat of chemical warfare. The FPE and SCBA will be donned in the event of a fire or rescue in a chemical-warfare environment.

**BASIS OF ISSUE:** The J-FIRE will be issued to Army firefighters in the following quantities:

- SCBA with mask: one per individual.
- FPE: one per individual.
- CB protective suit: three per individual.

**TRAINING/PERSONNEL:** Personnel will receive training for the J-FIRE through service schools, technical manuals (TMs), and unit training.

LEGACY

INTERIM

OBJECTIVE

---

## Small Emplacement Excavator (SEE)

---



**DESCRIPTION:** The SEE is a lightweight, all-wheel-drive, diesel-engine-driven, high-mobility vehicle with a backhoe, a bucket loader, and other attachments such as a handheld hydraulic rock drill, a chain saw, and a pavement breaker. The SEE weighs over 16,000 pounds, is air transportable, can travel at speeds of more than 40 miles per hour on improved roads, and has limited off-road mobility.

**STATUS:** The SEE is fielded. New and developing equipment is being observed as a possible replacement for the SEE as it approaches its life expectancy.

**EMPLOYMENT CONCEPT:** The SEE is used to rapidly dig combat emplacements (for example, crew-served weapon positions, command posts, and individual fighting positions) for units in the main battle area. The high mobility of the SEE provides an earthmoving machine capable of rapid movement between battle positions.

### **BASIS OF ISSUE:**

- 1 per squad, Engineer Battalion, Airborne, Air-Assault, Infantry, and Light Infantry Division
- 1 per equipment section, Engineer Company (Combat Support)
- 2 per equipment section, Engineer Company, Corps Airborne and Light
- 1 per platoon, Engineer Company, Armored Cavalry Regiment, Separate Infantry Brigade
- 1 per platoon, Engineer Company (Corps Combat)
- 1 per platoon, Engineer Company (Pipeline Construction)
- 2 per platoon, Engineer Company, Separate Infantry Brigade
- 2 per platoon, Engineer Company, Corps Airborne and Light
- 2 per Engineer Company, Heavy Division
- 2 per Engineer Company, Corps (Mechanized and Wheeled)
- 2 per Engineer Company, Combat Heavy
- 1 per Engineer Company (Port Construction)
- 1 per Engineer Utilities Team (4000)

Additionally, the SEE replaced the JD-410 excavator one for one in all other Army units.

**TRAINING/PERSONNEL:** The United States Army Engineer School (USAES) at Fort Leonard Wood, Missouri, provides training for the operator (military occupational specialty [MOS] 62J) and maintainer (MOS 62B). Familiarization is conducted for all engineers during the Basic Noncommissioned Officer Course (BNCOC), the Advanced Noncommissioned Officer Course (ANCOC), the Engineer Officer Basic Course (EOBC), and the Engineer Officer Advanced Course (EOAC).

LEGACY

INTERIM

OBJECTIVE

---

## Small Emplacement Excavator (SEE)—Hydraulic-Mounted Attachments

---

**DESCRIPTION:** The SEE will have one or more additional mounted hydraulic attachments. They will be commercial-off-the-shelf (COTS) attachments requiring minimum modification to the SEE for hydraulic connections.

**STATUS:** Attachments are available for units to purchase locally.

### EMPLOYMENT CONCEPTS:

**Boom-mounted earth auger.** This auger supports engineer missions throughout the tactical zone of operations. Typical operations are drilling holes to emplace pumps or slurry explosives, drilling inspection holes, making road craters, setting utility poles, creating obstacles, and developing vertical constructions.

**Boom-mounted multiple-tooth ripper bucket.** This bucket is used year-round for rock removal and frozen-soil excavation. It digs faster than a single pointed ripper bucket when excavating frozen ground, sandstone, limestone, caliche, shale, and coral. Typical operations are the same as the existing SEE's backhoe bucket.

**Boom-mounted tamper/compactor.** This equipment supports engineer missions throughout the tactical zone of operation. Typical operations include compacting materials at construction projects, supporting airfield and helipad damage repair, and repairing craters in lines of communications (LOCs).

**Boom-mounted pavement breaker.** This breaker performs heavy-duty breaking at construction and maintenance sites, bridge sites, or resupply points. Typical operations are the reduction of asphalt, concrete, or rock; supporting the repair of airfields, bridges, or roads; and constructing command posts (CPs).

**Front-mounted rotary sweeper.** This sweeper is used at construction and maintenance sites. Typical operations include sweeping permanent-type surfaces at airfields/roadways and parking aprons, controlling dust in environmentally sensitive areas (such as hospital complexes), and sweeping debris from supply routes and troop-construction-project sites.

**BASIS OF ISSUE:** Attachments will be found in most engineer units in amounts appropriate for their missions.

**CURRENT STATUS:** The attachments are being reviewed for their capability to be used with existing and new excavators.

**TRAINING/PERSONNEL:** The United States (US) Army Engineer Center will provide minimum familiarization during military occupational specialty (MOS) 62J advanced individual training (AIT) and noncommissioned officer (NCO) courses. The attachments will be maintained by MOS 63B personnel.

LEGACY

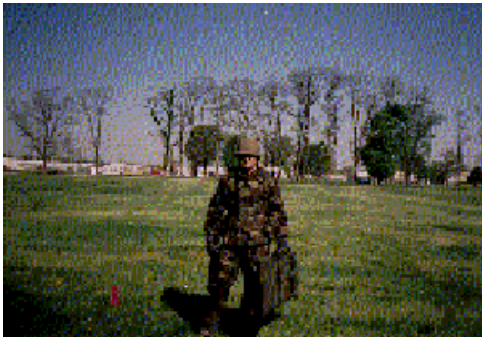
INTERIM

OBJECTIVE

---

## Soldier Fighting Cover (SFC)

---



**DESCRIPTION:** The SFC is a 6-feet by 5-feet 4-inch laminated fabric cover that has seamed tubular sections along two sides and weighs less than 12 pounds. The sections are filled with logs or earth and placed in shallow trenches on each side of the emplacement to be covered. Soil backfill is placed over the cover to a uniform depth of 18 inches. Two or more panels may be snapped together to cover connecting trenches.

**STATUS:** The SFC was type classified in 1994, and 3,000 covers were placed in depot storage. Until recently, a limited procurement history created a backlog in the requests for this item. An improved version of the cover is being developed by the United States (US) Army Engineer School (USAES) in conjunction with US Army Infantry School (USAIS).

**EMPLOYMENT CONCEPT:** The SFC is intended to provide ballistic fragment protection from indirect supporting fires from threat forces when employed with 18 inches of compact soil above it. The individual soldier will use the SFC anywhere he is exposed to artillery or other indirect fires.

**BASIS OF ISSUE:** One per individual in infantry or other combat units as required.

**TRAINING/PERSONNEL:** The service schools of the combat branches will provide training during various courses. At the unit level, training will be conducted primarily as individual training.

LEGACY

INTERIM

OBJECTIVE

---



## Ultralightweight Camouflage Net System (ULCANS)

---



**DESCRIPTION:** The ULCANS is an all-weather, modular concealment system providing multispectral signature reduction (visual, thermal, ultraviolet, and radar). Designed for snag-free, rapid deployment and recovery, it is field repairable and maintainable and will be provided in woodland, desert, snow, and urban patterns. The ULCANS will screen weapons systems, vehicles, tactical operation centers, aircraft, logistics systems, and other equipment.

**STATUS:** The woodland variant is type-classified as standard and achieved materiel release in February 2001. The desert variant is undergoing radar and thermal testing and is scheduled for a Milestone (MS) III production decision in July 2001. Though currently unfunded in the program objective memorandum (POM), limited numbers have been produced and are being fielded to the 10th Mountain Division, the 1st Initial Brigade Combat Team (IBCT), and the XVIII Airborne Corps.

**EMPLOYMENT CONCEPT:** The ULCANS provides multispectral, ultralightweight camouflage protection to the force across the entire battlefield. It is operationally similar to existing Legacy camouflage screen systems, though deploy and recover times are significantly reduced due to the snag-free design.

**BASIS OF ISSUE:** The ULCANS will be issued to the force as a one-for-one replacement for the Lightweight Camouflage Screening System (LCSS) based on the unit's primary theater of deployment (woodland, desert, urban, or snow).

**TRAINING/PERSONNEL:** All specialties will employ and maintain the ULCANS. The system will be trained at the unit level.

LEGACY

INTERIM

OBJECTIVE

---

**SECTION II**

**FIELDDED SYSTEMS**

**Part 4. General Engineering**



25-Ton Trailer, M172A1

---

**DESCRIPTION:** The 25-ton trailer is a fixed gooseneck design, rear-loading trailer capable of a 25-ton payload.

**STATUS:** The current 25-ton trailers were manufactured in the 1973 to 1975 time frame. The average age is 25 to 27 years; the usable life of the trailer is 30 years. No money is authorized for this program because there are 879 excess 25-ton trailers throughout the various major commands (MACOMs) with no disposition. Units in the field are reporting these trailers to the Department of the Army (DA) at 90 percent or above the operational readiness rates. This meets or exceeds the Army’s equipment-readiness goal of 90 percent or above. Most units state that the trailers are assets and they have very few problems with them. Some parts are becoming difficult to obtain or take an extremely long time to receive.

**EMPLOYMENT CONCEPT:** The M172A1 is used to transport equipment in engineer units throughout the theater of operations (TO).

**BASIS OF ISSUE:** Replacement of existing M172A1 semitrailers throughout the field.

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSs) will be required to operate and maintain the M172A1. Needed training will be conducted at the unit level during the time of fielding.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---

## Air-Assault (AASLT) Tactical Earthmoving Equipment (T-3/4 and T-5 Dozers)

---



**T-3/4 (JD550/450 Dozer)**



**T-5 (D-5 Dozer)**

**DESCRIPTION:** The T-3/4 is a light (about 18,000 pounds) tractor that is air droppable and can be transported by an external helicopter lift. The T-5 dozer weighs about 33,000 pounds and is fielded in two types to meet the needs of both airborne and AASLT units. The T-5 Type I nonsectionalized version is used by airborne units and the T-5 Type II sectionalized version is used by units supporting AASLT missions. Both types are capable of being air dropped. The T-5 Type II dozer can be sectionalized into two segments for external lift by medium-lift helicopters.

**STATUS:** The complete fleet of T-3 dozers (JD550G) were procured and fielded in 1983. A majority of the T-3 dozers were replaced with the T-4 dozer (JD450) in 1997. The deployable universal combat earthmover (DEUCE) is currently being fielded and is replacing all Type I nonsectionalized T-5 dozer requirements. The Type II sectionalized T-5 dozers will remain in the Army fleet and undergo a Service Life Extension Program (SLEP).

**EMPLOYMENT CONCEPT:** Division and nondivision AASLT engineer units employ the equipment in offensive, defensive, and rear-area combat operations. This equipment, the M9 armored combat earthmover (ACE), and other combat-support (CS) equipment are complementary systems. This equipment package has enabled using units to rapidly relocate (strategically or tactically) in order to expand and improve an airhead for follow-on support. This equipment can also be used to accomplish mobility, countermobility, and survivability tasks.

### **BASIS OF ISSUE:**

<u>Equip</u>	<u>SRC</u>	<u>UNIT</u>	<u>REQ</u>
T-3/4	05215L0	326th En Bn	12
*T-5	05443L2	220th En Co	12
	05447L2	1140th En Bn	15
	05423L0	82d CSE Co	4
	N/A	NG	2 (operational readiness float)

\*The effective basis-of-issue plan (BOIP) date is September FY03.

**TRAINING/PERSONNEL:** Operator training is conducted on-site. Training is reinforced through on-the-job training (OJT) at the unit level.

## Fielded Systems - General Engineering

LEGACY

INTERIM

OBJECTIVE

---

## Airborne/Air-Assault Grader

---



**DESCRIPTION:** The airborne/air-assault grader is a modified commercial piece of construction equipment used for grading, shaping, bank sloping, ditching, and scarifying. The air-assault version can be broken down into two segments for external lift by medium-lift helicopters. This grader is diesel-engine driven and has pneumatic tires. It has articulated frame, steer-type, front-wheel steering.

**STATUS:** The airborne/air-assault grader is currently fielded.

**BASIS OF ISSUE:**

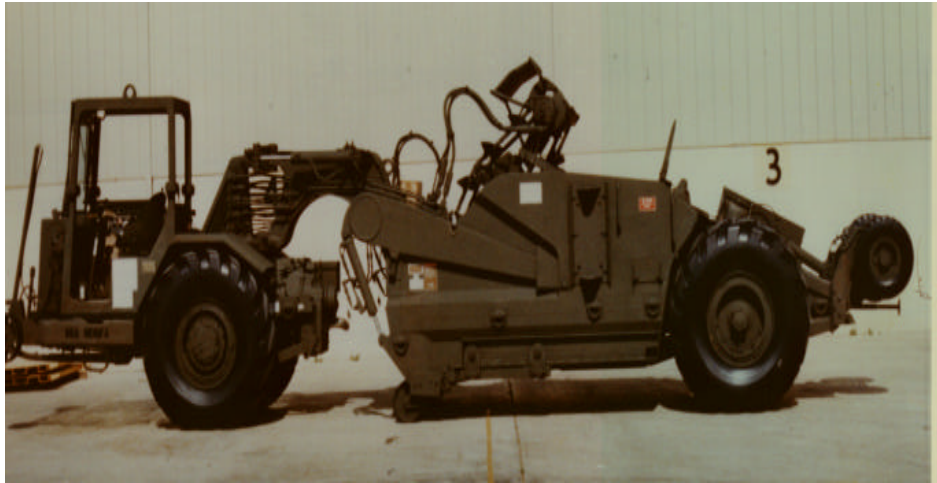
Nonsectionalized	
Light-Equipment Airborne	9
Light-Equipment Company	9
Engineer Company Corps Airborne	3
Engineer Company Corps Light	3





## **Airborne Scraper System, 2,500-Gallon**

---



**DESCRIPTION:** The airborne scraper is a self-propelled, open-bowl, pneumatic, two-axle, single-diesel-engine-driven, articulated-frame steer vehicle. Its loading capacity is 9 to 11 cubic yards minimum struck, and self load. Production is increased when assisted by a pusher-tractor during loading. The scraper provides a self-loading, hauling, and dumping capability to perform efficient earthmoving tasks in support of earthmoving projects.

**STATUS:** The plan for the airborne scraper is to rebuild and rebuy it in conjunction with the water-distributor scraper over a period of time to keep the system readily mission capable.

**EMPLOYMENT CONCEPT:** The airborne scraper will be deployed by airborne and air-mobile units to perform cutting, hauling, and dumping of earth material where road-construction clearance is important.

**BASIS OF ISSUE:** The scraper will be issued to light-equipment companies, engineer battalion corps light companies, light equipment airborne companies, and engineer battalion corps airborne companies.

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62E10-20 or maintainer 63B10-30.

LEGACY

INTERIM

OBJECTIVE

---

All-Terrain Crane (ATEC), 22.5-Ton

---



**DESCRIPTION:** The ATEC replaces all cranes of the 20- to 25-ton class. This crane provides units with the lift capability used to complete numerous general construction-engineering tasks. The ATEC has limited pile-driving capabilities due to the small size and strength of its superstructure. In addition to engineer units, the ATEC is used by quartermaster, ordnance, and transportation units.

**STATUS:** The wheel-mounted cranes have exceeded their 15-year life cycle; only a few engineer units still have these cranes. Fielding of the ATEC started in September 1998 and will continue through FY03. The ATEC replaces both truck- and wheel-mounted cranes on a one-for-one basis in most units.

**EMPLOYMENT CONCEPT:** The ATEC crane will be deployed by using units instead of the 25-ton P&H or Grove crane. The ATEC crane provides the same lifting and loading capability but has a limited pile-driving height capability.

**BASIS OF ISSUE:** The ATEC is authorized in the equipment platoons and quarry sections of the Engineer Construction-Support Company; Combat-Heavy, Port-Opening Company; Corps Wheeled Company; Pipeline Company; and Engineer Bridge Companies.

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62F10-20 or maintainer 63B10-40.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---

## Asphalt Melter

---



**DESCRIPTION:** The asphalt melter is a skid-mounted, 750-gallon-per-hour de-drumming asphalt melter. The de-drumming tunnel is capable of removing 85- to 100-penetration cement from twelve 55-gallon drums at one time. The unit also contains a 3,000-gallon hot-storage compartment for heating the asphalt to pumping temperature (235°F). The melter can operate individually, in pairs, or in trios, in parallel from a single source of hot oil.

**STATUS:** The need for this equipment and the quantity required per unit is currently being validated.

**EMPLOYMENT CONCEPT:** The asphalt melter will be introduced into a theater of operations (TO) to provide hot asphalt mix for horizontal-construction projects in support of military or other national goals and objectives.

**BASIS OF ISSUE:** Two asphalt melters will be issued to each engineer combat-heavy battalion and two to each engineer combat-support (CS) company.

**TRAINING/PERSONNEL:** The melter will be operated by military occupational specialty (MOS) 62H personnel. Introductory training is conducted during advanced individual training (AIT), with continuous-operations training done at the unit.

LEGACY

INTERIM

OBJECTIVE

---

## Asphalt Mixing Plant

---



**DESCRIPTION:** The asphalt mixing plant is a portable drum-type, electric-motor-driven facility capable of self-erection (major components) and satisfactory operation without permanent-type footings. It consists of major units, components, and accessories as required to assemble a complete plant capable of producing 150 tons per hour (TPH) of graded asphalt paving mix. It is trailer mounted and can be interconnected mechanically and electrically and operated to the rated capacity.

**STATUS:** Documentation is currently being completed for reprocurement, with fielding to begin in FY03 for four plants.

**EMPLOYMENT CONCEPT:** The asphalt mixing plant will be used in a theater of operations (TO) to provide hot asphalt mix for horizontal construction projects in support of military or other national goals and objectives.

**BASIS OF ISSUE:** The plant is issued to engineer combat-service-support (CSS) units.

**TRAINING/PERSONNEL:** A soldier holding military occupational specialty (MOS) 62H is the operator for the plant; MOS 62B, 52D, 52C, 63B, and 63W soldiers are required to maintain the plant. Introductory training is conducted in advanced individual training (AIT) with continuous-operations training done at the unit.

LEGACY

INTERIM

OBJECTIVE

---

## **Crane, 7.5-Ton**

---



**DESCRIPTION:** This lightweight, airborne-capable, 7.5-ton-capacity crane system provides airborne, aviation, combat-support (CS), and light-equipment units with maximum unit mobility in support of light lifting tasks and cargo handling. It uses an extending hydraulic boom to reach a maximum height of 30 feet and a maximum horizontal reach of 28 feet. Capacities are reduced at extended reach distances. The crane is equipped with a simple hook block for lifting. The crane is capable of negotiating unimproved surfaces but is not considered to be rough-terrain capable. A crew of one is required.

**STATUS:** There are no ongoing actions at this time.

**EMPLOYMENT CONCEPT:** This system will be used by specific units that require light lifting around the job site as a supporting asset to lift, load, and carry loads for mission requirements.

**BASIS OF ISSUE:**

Construction-Support Company  
Combat-Support-Equipment (CSE) Company  
Light-Equipment Unit  
Aviation Unit  
Airborne Unit

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62F10-20 or maintainer 63B10-30.

LEGACY

INTERIM

OBJECTIVE

---

## Deployable Universal Combat Earthmover (DEUCE)

---



**DESCRIPTION:** The DEUCE is a high-speed, high-mobility, rubber-tracked, earthmoving system capable of conducting excavating operations in support of mobility, countermobility, survivability, and sustainment engineering missions. Its earthmoving capability will at least match the current D5B dozer. Instead of traditional steel tracks, the DEUCE uses one-piece rubber tracks to allow travel on paved surfaces. This is an acquisition category (ACAT) level IV program.

**STATUS:** The DEUCE is currently being fielded.

**EMPLOYMENT CONCEPT:** The DEUCE performs the same missions as the bulldozer it replaces. The DEUCE provides self-mobility between job sites and arrives faster. This represents a significant increase in total work effort.

**BASIS OF ISSUE:** The DEUCE will replace the D5B dozers presently in airborne/airmobile units and the D-7s in 2nd Armored Cavalry Regiment (ACR) and light infantry division (LID) units. The DEUCE will also be fielded to the interim brigade combat teams (IBCTs) and the interim division.

**TRAINING/PERSONNEL:** Training will be designed for personnel holding military occupational specialty (MOS) 62B, active- and reserve-component combat engineers, and the Engineer Officer Basic and Advanced Courses.

LEGACY

INTERIM

OBJECTIVE

---



## Dual Steel-Wheeled Roller

---



**DESCRIPTION:** The dual steel-wheeled roller is a self-propelled, tandem, steel-wheeled roller with a vibratory mechanism used for compacting asphalt and chip-and-seal surfaces.

**STATUS:** The dual steel-wheeled roller's fielding was completed in FY97. The next scheduled reprocurement is for FY10.

**EMPLOYMENT CONCEPT:** The dual steel-wheeled roller will be employed in engineer units throughout the theater of operations (TO) that have earthmoving and compaction missions. Smooth-drum-rolling construction tasks include support of critical runway construction; runway repair; construction of roads, open storage areas, and hardstands; and other horizontal-construction missions.

**BASIS OF ISSUE:**

05416L000 Combat Heavy Battalion	40
05413L000 Construction-Support Company	32

**TRAINING/PERSONNEL:** The dual steel-wheeled roller will be operated by military occupational specialty (MOS) 62J personnel and maintained by MOS 62B personnel assigned at the organizational level. Training for the roller will be conducted during advanced individual training (AIT).

LEGACY

INTERIM

OBJECTIVE

---

## Dump Trucks

---



M917A1 Heavy Dump Truck



FMTV

**DESCRIPTION:** The primary haul capability in engineer units for earth, rock, aggregate, and construction materials is accomplished by 2 1/2-ton, 5-ton, and 20-ton dump trucks. All models are equipped with tandem axles, dual wheels, and a rear dump body. The 2 1/2- and 5-ton dump trucks are a part of the tactical wheeled vehicle series used throughout the Army. The 20-ton dump trucks are commercial vehicles with minor modifications to meet military use. The 2 1/2- and 5-ton dump trucks serve a dual role of engineer squad carrier and a carrier for equipment and construction materials. The 2 1/2- and 5-ton dump trucks are capable of being operated over all types of roads, highways, and cross-country terrain. The 20-ton dump trucks are authorized where large and/or long hauling requirements exist.

**STATUS:** The new family of medium tactical vehicles (FMTV) dump trucks M1090 and M1094 (5-ton air drop) will replace the 2 1/2-ton dump truck. The FMTV started fielding in July 1998. The FMTV dump trucks have experienced some problems in the field and are currently being retrofitted for structural improvements. Initial fielding of the M917A1 heavy dump truck began in October 1998.

**EMPLOYMENT CONCEPT:** The 2 1/2- and 5-ton dump trucks are used to tow trailers; carry squad tools and personnel; and haul earth, rock, general cargo, and construction materials in support of unit missions. The 20-ton dump trucks are used when there is a large requirement for earth, gravel, and asphalt in support of major construction, repair, and maintenance projects or to remove debris.

**BASIS OF ISSUE:** The 2 1/2-ton dump-truck authorization is limited to airborne/airmobile units. The 5-ton dump trucks (M1090 and M1094) are authorized at the platoon level in division and nondivision engineer units (to include airborne/airmobile units). The 20-ton dump truck is authorized in the following units:

- Headquarters and Support Company.
- Engineer Combat-Heavy Battalion.
- Combat- and Construction-Support Company.
- Engineer Dump-Truck Company.

**TRAINING/PERSONNEL:** Operator training is conducted through on-the-job training (OJT) at the unit level. Maintenance training is taught at several locations to advanced-individual-training (AIT) students in Career Management Field (CMF) 63 and is reinforced through OJT at the unit level.

LEGACY

INTERIM

OBJECTIVE

---

Engineer Mission Modules—Bituminous Distributor  
(EMM-BD)

---



**DESCRIPTION:** The EMM-BD is a demountable unit capable of repeated use with the Palletized Load System (PLS) and compatible for transport and operations on the PLS truck and trailer. Hydraulic, electric, and pneumatic power are provided by the Universal Power Interface Kit (UPIK) on the PLS truck. When loaded, the EMM-BD provides a means for spreading measured amounts of bituminous material for road preparation along with other engineering applications. The EMM-BD is computer controlled, and the spraying width can be varied by small increments. The EMM-BD has a capacity of 2,800 gallons and 12-foot spray bars.

**EMPLOYMENT CONCEPT:** The EMM-BD will replace existing equipment and enhance the engineer corps and supported forces in the areas of combat support (CS), combat service support (CSS), and general construction missions.

**BASIS OF ISSUE:**

05413L, Engineer Company, Construction Support	8
05416L, Heavy Support Company, Combat, Heavy Battalion	40
05416L, Heavy Support Company, Combat Heavy Battalion (Pre-positioned)	1

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSs) will be required to operate/maintain the family of loaders (FOL).

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---

## Engineer Mission Modules—Concrete Mobile (EMM-CM)

---



**DESCRIPTION:** The EMM-CM is a demountable unit with a self-contained power supply capable of repeated use with the Palletized Load System (PLS) and compatible for transport and operation on the PLS truck and trailer. The EMM-CM is also operable as a stand-alone unit without assistance from the PLS truck. The EMM-CM provides a means to carry raw materials for concrete in separate compartments for mixing on the job site, and it performs these functions throughout the PLS mission profile. In a stationary mode of operation, the EMM-CM has an 8-cubic-yard capacity; in a mobile mode, it has a 5-cubic-yard capacity.

**EMPLOYMENT CONCEPT:** The EMM-CM will replace existing equipment and enhance the engineer corps and supported forces in the areas of combat support (CS), combat service support (CSS), and general construction missions.

**BASIS OF ISSUE:**

Engineer Company, Port Opening	9
Heavy Support Company, Combat Heavy Battalion	120
Heavy Support Company, Combat Heavy Battalion (Pre-positioned)	3
Utilities Team	26
United States Army Engineer School (USAES)	4

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSSs) will be required to operate/maintain the family of loaders (FOL).

LEGACY

INTERIM

OBJECTIVE

---

## Engineer Mission Modules—Dump Body (EMM-DB)

---



**DESCRIPTION:** The EMM-DB is a demountable unit capable of repeated use with the Palletized Load System (PLS) and compatible for transport and operation on the PLS truck and trailer. The EMM-DB will be used to load, transport, and dump payloads of sand and gravel aggregates, crushed rock, hot paving mixes, earth, clay, rubble, and large boulders at engineering and construction sites. It has a capacity of 12 cubic yards or 14 cubic yards with sideboards, up to 13 tons.

**EMPLOYMENT CONCEPT:** The EMM-DB will replace existing equipment and enhance the engineer corps and supported forces in the areas of combat support (CS), combat service support (CSS), and general construction missions.

**BASIS OF ISSUE:** Two modules per truck and trailer.

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSSs) will be required to operate/maintain the family of loaders (FOL).

LEGACY

INTERIM

OBJECTIVE

---

## Family of Loaders (FOL)

---



**DESCRIPTION:** The FOL is a nondevelopmental program integrating commercial front-end light/heavy loader technology in a front-end loader that will support the following five areas:

- Light, Type I, airborne (line item number [LIN] 76556), 2.5-cubic-yard multipurpose clamshell bucket.
- Light, Type II, air assault (LIN 76693), 2.5-cubic-yard multipurpose clamshell bucket.
- Light, Type III, general purpose (LIN 76556), 2.5-cubic-yard multipurpose clamshell bucket.
- Heavy, Type I (LIN 76315), 4.5-cubic-yard rock bucket.
- Heavy, Type II (LIN 76321), 5.0-cubic-yard general-purpose bucket.

The FOL will lift, move, and excavate consolidated earth, blasted rocks, loose sand, aggregate, and soil involved with the military construction of roads, bridges, airfields, and medical facilities; the demolition of structures; and loading in quarry operations. The FOL will load all Army dump trucks, concrete mobiles, mixers, hoppers, and aggregate bins.

**EMPLOYMENT CONCEPT:** The FOL will replace existing equipment and enhance the engineer corps and supported forces in the areas of combat support (CS), combat service support (CSS), mobility, deployability, countermobility, survivability, support of base camps, excavation of raw material, and general construction missions.

**BASIS OF ISSUE:** The FOL will be assigned and used by heavy, combat-support-equipment (CSE), and light-engineer units. A focus of the light FOL (Types I thru III) mission is to support airborne, air-assault, and other engineer units. The heavy FOL (Types I thru III) mission is to support quarry operations and all heavy, combat support companies (CSCs) and CSE units. These will be a one-for-one replacement.

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSs) will be required to operate/maintain the FOL.

LEGACY

INTERIM

OBJECTIVE

---



## Heavy Road Grader

---



**DESCRIPTION:** The heavy road grader has a diesel engine, pneumatic tires, and 6x4 front steering with an articulated-frame steer type. It is equipped with a power-shift transmission, fully enclosed cab, hydraulically operated blade, and scarifier. The grader is used for grading; shaping; bank sloping; ditching; scarifying; and general construction and maintenance for roads, airfields, and other horizontal construction project.

**STATUS:** The existing fleet of heavy graders is nearing the end of its life cycle. A service-life-extension program will be implemented in FY03.

**EMPLOYMENT CONCEPT:** The heavy road grader will be deployed as a finisher to gravel or dirt or before paved road application. It is used to smooth or slope material used in road construction.

**BASIS OF ISSUE:** The heavy road grader will be issued to engineer company combat-heavy battalions, engineer company combat-support-equipment (CSE) units, and engineer combat company corps wheeled utilities teams.

**TRAINING/PERSONNEL:** No new military occupational specialty (MOS) or special identifier will be needed for user 62E10-20 or maintainer 63B10-30.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---

## High-Speed Compactor (HSC)

---



**DESCRIPTION:** The HSC is a self-propelled, diesel-powered, tamping machine for high-speed embankment compaction during the construction of roads, airfields, and dams. It has articulated steering and a hydraulically controlled strike-off dozer blade. All wheels have tamping feet or segmented impact drums with adjustable wheel cleaners. It is capable of compacting at least 1,500 cubic yards per hour of soil conforming to the American Society of Testing and Materials (ASTM) D Soil Classification Chart, Type SC, having a plasticity index of between 10 and 25 inclusive or at least 95 percent modified American Association of State Highway and Transportation Officials (AASHTO) in compacted lifts of not more than six inches.

**STATUS:** The Caterpillar 815F compactor is currently under contract as the HSC to replace the BOMAG K300. The first-unit-equipped (FUE) date was March 1997. To date, 132 compactors have been fielded. The next scheduled fielding is in FY10.

**EMPLOYMENT CONCEPT:** Engineers will use the HSC in constructing roads, airfields, and dams and in other horizontal construction projects.

**BASIS OF ISSUE:**

05417L000, Engineer Company, Engineer Combat Battalion, Heavy	1
05423L000, Engineer Company, Combat Support Equipment (Engineer Brigade)	3
United States Army Engineer School (USAES)	6

**TRAINING/PERSONNEL:** Operator (military occupational specialty [MOS] 62J) and maintainer (MOS 62B) training will be conducted at the USAES to advanced individual training (IET) students. Training will be reinforced through on-the-job training (OJT) at the unit level.

---

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

---

Hot-Oil Heater



**DESCRIPTION:** The hot-oil heater is a trailer-mounted, heavy-duty, high-output-capacity unit designed to transfer oil and pump it through transmission lines to the asphalt melter and storage tank requiring heat. Fuel and external electric power are required for operation.

**STATUS:** The equipment need and the quantity per unit are currently being validated.

**EMPLOYMENT CONCEPT:** The hot-oil heater will be introduced into a theater of operations (TO) to provide hot asphalt mix for horizontal-construction projects in support of military or other national goals and objectives.

**BASIS OF ISSUE:**

- Engineer combat-service-support (CSC) units 2 per unit
- Engineer combat heavy battalions 1 per unit

**TRAINING/PERSONNEL:** Military occupational specialty (MOS) 62H personnel are the operators for the hot-oil heater. Introductory training is conducted during advanced individual training (AIT), with continuous-operations training done at the unit.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

## Hydraulic Excavator (HYEX)

---



**DESCRIPTION:** The HYEX will be used to excavate and load earth, blasted rock, sands, and other types of aggregate into standard Army trucks, concrete mobiles, and rock-crushing units. The HYEX is nondevelopmental construction equipment that is purchased commercially off the shelf (COTS). It is diesel driven, self-propelled, and hydraulically operated. It has a track-mounted undercarriage with a knuckle-type boom. There are three types of HYEXs—Types I, II, and III.

**STATUS:** The HYEX is currently being fielded.

**EMPLOYMENT CONCEPT:** The HYEX will be introduced into the theater of operations (TO) to provide excavation for horizontal construction projects in support of military or other national goals or objectives. The HYEX will provide rapid excavation for construction and repair of runways, roads and trails, railroads, pipelines, waterways, and quarry operations. The HYEX will be used in the rear area to construct medium to large obstacles and bunkers.

**BASIS OF ISSUE:** The HYEX will be fielded to combat-heavy companies, combat-support (CS) companies, quarry teams, port-construction companies, pipeline companies, and panel- and multirole-bridge companies.

**TRAINING/PERSONNEL:** No new military occupational specialties (MOSs) will be required to operate and maintain the HYEX.

LEGACY

INTERIM

OBJECTIVE

---

## Laser Leveling Device (LLD)

---



**DESCRIPTION:** The LLD is mounted to graders, scrapers, dozers, and hydraulic excavators. The LLD is used to enhance digging, leveling, and sloping production by cutting and filling to grade in fewer passes with consistent accuracy at higher operating speeds with the use of laser-beam technology in all climatic conditions day or night.

**STATUS:** The LLD was first fielded in FY97 and is still being fielded. Current funding will be used to field the LLD to those units that are to receive the hydraulic excavator (HYEX).

**EMPLOYMENT CONCEPT:** The LLD will be employed in engineer units throughout the theater of operations (TO) that have earthmoving/construction missions. Construction tasks include support of critical runway construction; runway repair; construction of roads, open storage areas, and hardstands; and other horizontal construction missions.

**BASIS OF ISSUE:** Issue of the LLD is planned in conjunction with the HYEX fielding plan.

**TRAINING/PERSONNEL:** Training will be conducted at the unit level.

LEGACY

INTERIM

OBJECTIVE

---



## Low-Bed Semitrailer, M870A3

---



**DESCRIPTION:** The M870A3 is a tactical low-bed semitrailer designed for moving heavy engineer construction equipment, International Standards Organization (ISO) containers, and other miscellaneous equipment weighing up to 40 tons.

**STATUS:** The current M870A3 that is being developed has failed production verification testing (PVT) twice at Aberdeen Proving Grounds, Maryland. The trailer developed cracks along the welds at the axle-pin retainers and on the frame-rail cross members. Other cross members were found buckled. Documentation is currently under development for a more modern type of M870 that will also be referred to as the semitrailer, low-bed, construction-equipment transporter (SLCET). This trailer will have a detachable gooseneck, allowing loading from the front, and a usable deck space width of 102 inches that expands to 126 inches with the use of outriggers running the full length of the usable deck space.

**EMPLOYMENT CONCEPT:** The M870A3/SLCET will be used to transport engineer construction equipment in engineer units throughout the theater of operations (TO).

**BASIS OF ISSUE:** The M870A3 will replace the existing M870 semitrailers throughout the field.

**TRAINING/PERSONNEL:** No new military operational specialties (MOSSs) will be required to operate and maintain the SLCET. Needed training will be done at the unit level during the time of fielding.

LEGACY

INTERIM

OBJECTIVE

---



## **Paving Machine, Bituminous Material**

---

**DESCRIPTION:** The bituminous-material paving machine is a self-propelled, crawler-mounted, diesel-engine-driven machine with an 8-foot basic paving width. The paving machine is capable of laying, compacting, and finishing bituminous concrete strips 6 to 16 feet wide. The paving machine consists of a receiving hopper, a spreader, a compaction unit, cut-off shoes, and a screed with the capability of being extended.

**STATUS:** Documentation is currently being prepared for reprourement of the paving machine, with fielding to begin in FY03.

**EMPLOYMENT CONCEPT:** The bituminous-material paving machine will be introduced into a theater of operations (TO) to provide finished bituminous-concrete strips for horizontal-construction projects in support of military or other national goals and objectives.

**BASIS OF ISSUE:** Engineer combat service companies (CSCs).

**TRAINING/PERSONNEL:** Military occupational specialty (MOS) 62H personnel will operate the paving machine. MOS 62B personnel will maintain it. Introductory training is conducted in advanced individual training (AIT), with continuous-operations training done at the unit.

LEGACY

INTERIM

OBJECTIVE

---

## Pneumatic Tool and Compressor Outfit, 250 Cubic Feet Per Minute (cfm)

---



**DESCRIPTION:** The pneumatic tool and compressor outfit is a diesel-engine-driven, trailer-mounted, rotary-screw compressor with integral storage compartments and pneumatic tools with accessories. The tools consist of a pavement breaker, a rock drill, a wood borer, a nail driver, a centrifugal pump, a tamper, chain saws, circular saws, and accessories for each tool.

**STATUS:** The pneumatic tool and compressor outfit has been in the Army for a number of years. A multiyear (FY82 to FY85) procurement program for new tool and compressor outfits was concluded. Fielding was completed in 1986.

**EMPLOYMENT CONCEPT:** The compressor is capable of supplying large volumes of air under pressure to operate the pneumatic tools used in repair and construction of roads, bridges, landing strips, heliports, and port facilities. Tool and compressor outfits assigned to airborne/airmobile (ABN/AMBL) units are capable of air delivery using low-velocity airdrop and low-altitude parachute extraction procedures by C-130 aircraft and externally by the medium-lift helicopter. A 5-ton dump truck is normally used for towing the compressor outfit.

**BASIS OF ISSUE:** The tool and compressor outfit is assigned at platoon level in division (including ABN/AMBL) and nondivision combat engineer units and in other combat-support (CS) organizations.

**TRAINING/PERSONNEL:** Both operator and maintainer training for the pneumatic tool and compressor outfit is taught at the United States Army Training and Doctrine Command (TRADOC) institutional training base and reinforced through on-the-job training (OJT) at the unit level. The operator is a general-construction equipment operator (military occupational specialty [MOS] 62J). The maintainer is a construction equipment repairer (MOS 62B).

LEGACY

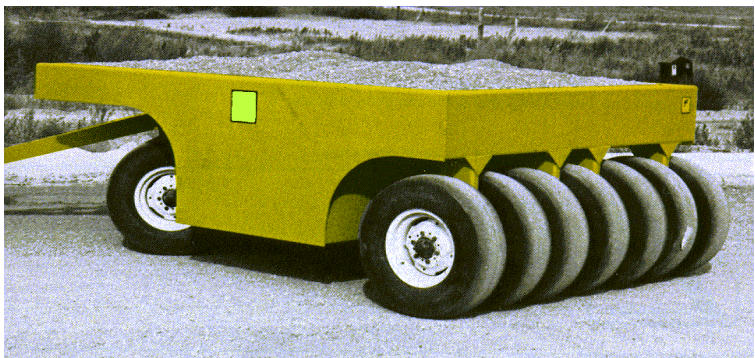
INTERIM

OBJECTIVE

---

## Towed Pneumatic Roller

---



**DESCRIPTION:** The towed pneumatic roller consists of a steel hopper body equipped with 13 pneumatic-tired, oscillating wheels with the front set mounted on a bolster. It is to be used by airborne units for horizontal-construction missions requiring dense compaction of various types of soil from natural run to modified mixtures.

**STATUS:** The towed pneumatic roller has been in the Army for a number of years. The current rollers were purchased in FY96 and FY97 and have a life cycle of 10 years. The next reprocurement is scheduled for FY08.

**EMPLOYMENT CONCEPT:** The towed pneumatic roller is to be used by airborne units for horizontal-construction missions requiring dense soil compaction.

**BASIS OF ISSUE:** The towed pneumatic roller is issued to airborne units only.

**TRAINING/PERSONNEL:** Operator training for the towed pneumatic roller is done at the unit level. The operator is a concrete/asphalt equipment operator (military occupational specialty [MOS] 62H). The maintainer is a construction equipment repairer (MOS 62B).

LEGACY

INTERIM

OBJECTIVE

---

## Tractor, Full-Track, Low-Speed, Medium T-9 Dozer (D-7)

---



**DESCRIPTION:** The crawler tractor, commonly referred to as a dozer or bulldozer, is the basic item of earthmoving equipment for heavy dozing and clearing. The tractor is equipped with a power-shift transmission and a hydraulically operated semi-U-type dozer blade with a tilt cylinder and a rear-mounted winch or ripper. The medium T-9 dozer (commonly referred to as a D-7) has an operating weight of 50,000 pounds of drawbar pull. Due to the low ground bearing pressure, the crawler tractor has the capability of working in adverse underfoot conditions and is normally the first piece of construction equipment on a job site. The tractor is used to perform dozing, rough grading, cutting and filling, and ripping and towing in support of general engineering tasks.

**STATUS:** Most of the T-9 dozer fleet has exceeded its life cycle. The T-9 fleet will be recapitalized to extend its service life.

**BASIS OF ISSUE:** The requirements for the D-7 with ripper are as follows:

<u>SRC</u>	<u>Unit</u>
05113L	Engineer Company, Armored Cavalry Regiment (ACR)
05143L	Engineer Company, Heavy Separate Brigade
05337L	Engineer Company, Engineer Battalion, Heavy Division
05416L	Headquarters Support Company (HSC) Combat Battalion Heavy
05417L	Engineer Company, Engineer Combat Battalion Heavy
05423L	Engineer Company, Combat Support Equipment (CSE)
05427L	Engineer Combat Company Corps Wheeled
05437L2	Engineer Company, Engineer Battalion C
05437L3	Engineer Company, Engineer Battalion C (M)

### Preposition Stocks

05337L	Engineer Company, Engineer Battalion Heavy Division
05416L	HSC, Combat Battalion Heavy
05417L	Engineer Company, Engineer Combat Battalion Heavy
05423L	Engineer Company, Combat Support Equipment (CSE)

## Fielded Systems – General Engineering

The requirements for the D-7 with winch are as follows:

<u>SRC</u>	<u>Unit</u>
05053L	Engineer Company, Light ACR
05113L	Engineer Company, ACR
05143L	Engineer Company, Heavy Separate Brigade
05153L	Engineer Company, Separate Infantry Brigade (SIB)
05156L	Headquarters and Headquarters Company (HHC), Light Infantry Division
05413L	Engineer Company, Construction Support
05416L	HSC Combat Battalion Heavy
05417L	Engineer Company, Engineer Combat Battalion Heavy
05427L	Engineer Combat Company, Corps Wheeled
05437L2	Engineer Company, Engineer Battalion C (X)
05437L3	Engineer Company, Engineer Battalion C (M)
05434L	Engineer Company, Pipeline Construction
05463L1	Engineer Company, Medium Girder Bridge (MGB)
05463L2	Engineer Company, Panel Bridge
05493L1	Engineer Company, Assault Float Bridge
05603L	Engineer Company, Port Construction

LEGACY

INTERIM

OBJECTIVE

---



## Tractor-Scraper, 14 to 18 Cubic Yards

---



**DESCRIPTION:** The scraper is a self-propelled, open-bowl, pneumatic-tired, two-axle, single-diesel-engine driven, articulated-frame steer vehicle. Its loading capacity is 14 cubic yards struck, and 20 cubic yards heaped. The normal mode of operation is to use a push tractor to maximize production (loading). The tables of organization and equipment (TOE) provide one tractor per three scrapers for this purpose. The self-propelled scraper can work alone and self load, but only at a greatly reduced production capacity. The scraper provides a hauling and dumping capability to perform efficient earthmoving tasks in support of earthmoving projects.

**STATUS:** The tractor-scraper combination was a first-time procurement against an approved requirement. It replaced over-aged assets of tractor-towed scrapers. Fielding began in FY84 and is completed.

**EMPLOYMENT CONCEPT:** The tractor-scraper is used for loading, hauling, and spreading earth materials. It is used by engineer units to improve, maintain, and construct combat trails, main supply routes, and airfields; excavate protective positions and antitank (AT) ditches; and develop essential logistics-support facilities.

**BASIS OF ISSUE:** This tractor-scraper replaced the old tractor-scraper combination (line item numbers [LINs] S56256 and W90790).

**TRAINING/PERSONNEL:** Operator (military occupational specialty [MOS] 62E) and maintainer (MOS 62B) training is conducted at the United States (US) Army Maneuver Support Center (MANSCEN). This training includes advanced individual training (AIT) for entry-level soldiers and noncommissioned officer (NCO) courses for skill levels two to four soldiers. Training is reinforced through on-the-job training (OJT) at the unit level.

**CURRENT STATUS:** No action is being taken at this time. Vehicles are being looked at under the Service-Life Extension Program (SLEP), which will upgrade vehicles according to a unit's priority level.

LEGACY

INTERIM

OBJECTIVE

---



## Fielded Systems – General Engineering

### Vibratory Plate Compactor

---

**DESCRIPTION:** The vibratory plate compactor is a gasoline-engine-driven, hand-operated compactor used to compact soil base material in close areas.

**STATUS:** The compactors were last fielded in FY 93.

**EMPLOYMENT CONCEPT:** The plate compactor is used to compact base material in confined areas.

**BASIS OF ISSUE:** The plate compactors are currently fielded.

**TRAINING/PERSONNEL:** Training is conducted at the unit level.

LEGACY

INTERIM

OBJECTIVE

---

## Vibratory Roller

---



**DESCRIPTION:** The vibratory roller is a self-propelled, vibratory compactor with removable pad feet that provide greater flexibility and increased compaction capabilities. Addition of the pad feet is accomplished by applying bolt-on pad-foot segments to the existing smooth drum. Three types of rollers will be purchased. A light roller (Type I and Type III) will be issued to light and airborne units to replace most of the towed compactors. A heavy version (Type II) will be comparable to the current vibratory roller.

**STATUS:** The vibratory roller is considered a reprourement and replaces existing compaction equipment. A contract was awarded to Caterpillar in April 1998. Fielding began 3QFY00 and will continue through FY02.

**EMPLOYMENT CONCEPT:** The vibratory roller will be employed in engineer units throughout the theater of operations (TO) that have earthmoving and compaction missions. The bolt-on-pad capability provides the means to efficiently compact both cohesive (clays) and noncohesive (sands and gravel) soils as well as smooth drum rolling. Construction tasks include support of critical runway construction; runway repair; construction of roads, open storage areas, and hardstands; and other horizontal construction missions.

### BASIS OF ISSUE:

#### Vibratory Roller, Type I

05427L000	Combat Corp Wheeled	2
05443L200	Light-Equipment Company	6
05447L200	Combat Engineer Company, Light	3

#### Vibratory Roller, Type II

05416L000	Combat Heavy Headquarters and Support	2
05417L000	Combat Heavy Company	2
05423L000	Construction Support Equipment	6
05530LH00	Utilities (4000) Team	1

#### Vibratory Roller, Type III

05443L100	Light Equipment, Airborne	6
05447L100	Combat Equipment Company, Airborne	6

## Fielded Systems – General Engineering

**TRAINING/PERSONNEL:** The vibratory roller will be operated by military occupational specialty (MOS) 62J personnel and maintained by MOS 62B personnel assigned at organizational level. Training for the vibratory roller will be conducted during advanced individual training (AIT).

LEGACY

INTERIM

OBJECTIVE

---

## Well-Drilling System, 600-Foot

---



**DESCRIPTION:** The current well-drilling system is a commercial nondevelopmental item (NDI). It is capable of drilling to a depth of 600 feet or more through rock and soil formations using percussion with air, rotary with air, and mud drilling techniques. The system consists of a truck-mounted well-drilling machine, a tender vehicle, and one 600-foot well completion kit. Any assembly/disassembly for air transportability must be within the capability of the crane on the tender vehicle.

**STATUS:** Well-drilling teams in active- and reserve-component units have the 600-foot well drilling rigs. These rigs were employed successfully within and outside of the continental United States (CONUS and OCONUS). A supplemental kit has been developed to allow drilling down to 1,500 feet.

**EMPLOYMENT CONCEPT:** Water wells supplement and shorten the logistical support required where adequate surface water is not readily available or has been contaminated or threatened. Wells are drilled by well-drilling teams that are organic or attached to nondivision engineer units. Rapid movement of the well-drilling equipment is essential. Well-drilling operations are conducted in two shifts to achieve a 24-hour drilling capability.

**BASIS OF ISSUE:** Currently, there is one active-component team and twelve reserve-component teams. Seventeen new RC teams will be added by FY07. All current teams have the 600-foot system. Selected teams have the 1,500-foot kit. The lone active-component team will transfer to the reserve component.

**TRAINING/PERSONNEL:** Well-drilling operators, military occupational specialty (MOS) 62J, E5, and above are trained by United States (US) Navy instructors at Port Heuneme, California. Soldiers holding the rank of sergeant or above are awarded the additional skill identifier of C3 upon completion of the Navy school.

LEGACY

INTERIM

OBJECTIVE

---

**Notes**

## **Fielded Systems – Topographic/Geospatial Engineering**

### **SECTION II**

#### **FIELDDED SYSTEMS**

#### **Part 5. Topographic/Geospatial Engineering**





## **Automated Integrated Survey Instrument (AISI)**

---



**DESCRIPTION:** The AISI integrates the capabilities of currently deployed direction- and distance-measuring devices with microcomputer technology. This automated survey instrument is a nondevelopmental item (NDI) and will be used for collecting, storing, retrieving, and processing survey data. It will also provide an automated and integrated survey system for both office support and fieldwork, with speeds matching AirLand Battle requirements.

**STATUS:** An operational and organizational (O&O) plan was approved by United States (US) Army Training and Doctrine Command (TRADOC) on 24 October 1986. The required operational capability (ROC) for the AISI is the Topographic Support System (TSS) ROC dated 20 January 1976. A contract was awarded 2QFY93 and the first unit was equipped in February 1995. A milestones (MS) I/III In-Process Review (IPR) for type-classification standard was completed in March 1995. Funds were programmed in FY98/99 to start upgrading the TerraModel software from Disk Operating System (DOS) to Windows training and sustainment. New Windows TerraModel software was shipped to units in December 1999. Training for this software contract is being processed now. The first units to receive training were the Defense Mapping School, the US Army Engineer School (Brown Hall), and Fort Bragg, North Carolina. An additional unit-training contract is being worked at US Army Communications-Electronics Command (CECOM). Contractor training will begin as soon as CECOM can get a contract signed. The point of contact (POC) at CECOM is Mr. Thomas Newman (commercial 732-532-5034) and the item manager is Mr. Dave Mace (commercial 732-532-5892). The POC at the US Army Maneuver Support Center (MANSCEN), Directorate of Combat Developments (DCD), Engineer Division is Mr. Monton (DSN 676-7970 or commercial 573-596-0131 Ext 3-7970). Mr. Monton's e-mail address is montond@wood.army.mil.

**EMPLOYMENT CONCEPT:** Due to the distance measured and the different type of surveys performed between topographic and construction survey requirements where the AISIs are needed, there will be two different but similar instruments. The AISI replaces theodolites and distance-measuring survey instruments.

### **BASIS OF ISSUE:**

#### **Topographic Engineers:**

Survey Team (05540LB)	4
Topographic Engineer Company Echelons Above Corps (EAC) (05607L)	8
Topographic Engineer Company (Corps) (05608C)	8

## Fielded Systems – Topographic/Geospatial Engineering

### Construction Engineers:

Engineer Group (Construction) (05412L1)	2
Engineer Group (Construction) (05412L2)	2
Engineer Battalion Combat Heavy (05415L)	3
Engineer Company Combat Support Equipment (05423L)	1
Engineer Light-Equipment Company (05443L1)	1
Engineer Light-Equipment Company (05443L2)	1
Engineer Combat Battalion (05445L1)	2
Engineer Combat Battalion (05445L1)	2
Engineer Combat Battalion (05445L2)	2
Engineer Team Utilities (05530LH)	1
Headquarters, Headquarters Company, Engineer Brigade (05602L)	1
Engineer Port-Construction Company (05603L)	3

**TRAINING/PERSONNEL:** The AISI instruction for military occupational specialty (MOS) 82D (Topographic Surveyor) was added to the Defense Mapping School course at Fort Belvoir, Virginia. Instruction for MOS 51T is conducted at the US Army Engineer School (USAES) at Fort Leonard Wood, Missouri.

LEGACY

INTERIM

OBJECTIVE

---

## **Digital Topographic Support System—Base (DTSS-B)**

---



**DESCRIPTION:** The DTSS-B (issued as the Terrain Imagery Integration Prototype/Terrain Information Extraction System [TIIP/TIES]) integrates commercial-off-the-shelf (COTS) hardware and laboratory-developed software to form a package. The DTSS-B provides topographic engineers direct access to data acquired by national systems and delivered by tactical-exploitation-of-national-capabilities (TENCAP) assets. Soldiers using the DTSS-B have the capability to produce topographic products (soft and hard) such as digital terrain elevation data, map substitutes, and three-dimensional (3-D) terrain products.

**STATUS:** The DTSS-B has been issued to the 30th Engineer Battalion (Topo), the 29th Engineer Battalion (Topo), and the United States (US) Army, Europe (USAREUR). The DTSS operational requirements document (ORD)/changes was approved by the US Army Training and Doctrine Command (TRADOC) on 13 February 1998. The DTSS ORD is at TRADOC for approval and includes replacing the entire Topographic Support System (TSS). The DTSS-B is under review for updating during FY01.

**EMPLOYMENT CONCEPT:** The DTSS-B will be deployed to the USAREUR, the US Army, Pacific (USAPAC) and the 30th Engineer Battalion (US Army Forces Command [FORSCOM]) according to the basis-of-issue plan (BOIP).

**BASIS OF ISSUE:** The BOIP is one per major regional contingency.

**TRAINING/PERSONNEL:** Training for the DTSS is being conducted at the National Imagery and Mapping Agency (NIMA).

LEGACY

INTERIM

OBJECTIVE

## Digital Topographic Support System—Deployable (DTSS-D)

---



**DESCRIPTION:** The DTSS-D was previously called the Multispectral Imagery Processor (MSIP). The DTSS-D hardware consists of the Common Hardware/Software I (CHS I) workstation, three large-format plotters, and the Earth Resources Data Analysis System (ERDAS) Imagine image-processing software. The workstation storage peripherals include internal 3.5-inch, 1.4-megabyte (MB) floppy, removable hard-disk drives (up to 11 gigabytes (GB) on line); an external compact-disk—read-only memory (CD-ROM) reader, a 4-millimeter (mm) digital audio tape (DAT) drive; a magneto-optical drive, and an 8-mm tape drive. The ERDAS Imagine image-processing software package has extensive applications to perform image processing of commercial and national digital imagery, imagery rectification, girding of rectified imagery (image maps), thematic layers, intelligence overlays, and graphic portrayals of environmental conditions. The initial hardware has been upgraded with a large format, a full-color Altek Scanner; a secure telephone unit (STU) III; ARC/INFO Geographic Information System (GIS) software; and an interim release of the DTSS-quick-response multicolor printer (QRMP) software. The DTSS-D is in the process of being upgraded to the new technology (NT) environment. The upgraded DTSS-D will be issued to units starting in April 2001.

**STATUS:** Thirty-five DTSS-D sets were purchased with FY94-95 funds. The sets were upgraded with software in 2QFY97. The National Imagery and Mapping Agency (NIMA) is training DTSS-D at this time. A basis-of-issue plan (BOIP) has been submitted for the set. The DTSS-D is being upgraded to NT in FY01. The DTSS-D was type classified AN/TYQ 77, national stock number (NSN) 6675-01-425-5602, on 7 July 1997. The DTSS operational requirements document (ORD)/changes were approved by the United States (US) Army Training and Doctrine Command (TRADOC) on 13 February 1998. The DTSS ORD is under revision and went through worldwide staffing. The updated DTSS ORD is presently at TRADOC for approval.

**EMPLOYMENT CONCEPT:** The DTSS-D is employed from brigade through echelons above corps (EAC).

**BASIS OF ISSUE:** Eighty-three DTSS-D sets will be procured and issued in FY 01 as follows:

- 10 sets per EAC Engineer Company (Topo), special requirements code (SRC) 05607.
- 8 sets per Corps Engineer Company (Topo), SRC 05608.
- 1 set per Division Terrain Team, SRC 05540LI and LN.
- 2 set per Digital Heavy Division, SRC 05540LG.
- 1 set for the US Army Engineer School (USAES).

## Fielded Systems – Topographic/Geospatial Engineering

**TRAINING/PERSONNEL:** Training was conducted using contractor and government (NIMA and the USAES) resources. NIMA will train upgrades to the DTSS-D. Soldiers, warrant officers 215D, and terrain analysts holding military occupational specialty (MOS) 81T will operate and manage the set. Instructor and key personnel training will be held 23 April through 4 May 2001. There will be two new-equipment training classes (7 through 18 May and 4 through 15 June 2001).

LEGACY

INTERIM

OBJECTIVE

---

## Digital Topographic Support System—Heavy (DTSS-H)

---



**DESCRIPTION:** The DTSS-H is housed in a 20-foot International Standards Organization (ISO) shelter and mounted on a 5-ton truck chassis. The DTSS-H is supported by Common Hardware System 2, environmental control units, generators, and communication equipment that are part of the standard Army inventory, as is the 5-ton truck chassis. The DTSS-H uses the latest commercial-off-the-shelf (COTS) technology relating to printers, scanners, digitizing, and computer workstations with associated image processing and Geographic Information System (GIS) software.

**STATUS:** The DTSS and the quick-response multicolor printer (QRMP) were combined due to technological advances in the DTSS-H. A prototype was prepared that allowed for a special in-process review (IPR) 3QFY96. A procurement contract was awarded in FY97. The DTSS-H was type classified as AN/TYQ 48, national stock number (NSN) 6675-01-442-2105, on 13 August 1993. The DTSS operational requirements document (ORD)/changes were approved by the United States (US) Army Training and Doctrine Command (TRADOC) on 13 February 1998. The DTSS-H is not in the DTSS updated ORD at TRADOC for approval. The DTSS-H will be replaced by the DTSS-Light (L) as time and funds are available.

**EMPLOYMENT CONCEPT:** The DTSS-H has been employed in each of the three active corps companies, in five of the six heavy divisions, and in the 37th Terrain Team in the 8th Army, Korea.

**BASIS OF ISSUE:** The line item number (LIN) is D11248. The basis-of-issue plan (BOIP) is two per Engineer Company (Topo) at Corps (special requirements code [SRC] 05608). One DTSS-H was issued in lieu of the DTSS-L for each terrain team (05540LI) in the heavy division.

**TRAINING/PERSONNEL:** Training is being conducted at the National Imagery and Mapping Agency (NIMA) at Fort Belvoir, Virginia, under the training task prepared by the US Army Engineer School (USAES).

LEGACY

INTERIM

OBJECTIVE

---



## **Digital Topographic Support System—Light (DTSS-L)**

---



**DESCRIPTION:** The DTSS-L is supported by the Common Hardware System 2, environmental control units, generators, and communication equipment that are part of the standard Army inventory as is the high-mobility, multipurpose, wheeled vehicle (HMMWV). The DTSS-L uses the latest commercial-off-the-shelf (COTS) technology relating to printers, scanners, digitizing, and computer workstations with associated image processing and Geographic Information System (GIS) software. The DTSS-L consists of one HMMWV with shelter, generator, and cargo trailer plus COTS equipment.

**STATUS:** The DTSS and the quick-response multicolor printer (QRMP) were combined due to technological advances into the DTSS-Heavy (H) and the DTSS-L. Twenty DTSS-L units (Unix version) have been produced and fielded to units. Sixteen DTSS-L units (new technology [NT]) are under contract for FY01.

**EMPLOYMENT CONCEPT:** The DTSS-L will be employed throughout the Army from brigade through echelons above corps (EAC).

**BASIS OF ISSUE:** The basis-of-issue plan (BOIP) is four to each of the two major regional contingency areas (special requirements code [SRC] 05607), six to each engineer company (corps) (SRC 05608), two to each terrain team at light divisions (SRC 05540LN) and heavy divisions (SRC 05540LI), seven to each digital heavy division, and one for each initial brigade combat team (IBCT). The total BOIP is 151 for the entire force. The DTSS-L was type classified AN/TYQ 67, national stock number (NSN) 6675-01-424-8516, on 9 January 1998.

**TRAINING/PERSONNEL:** Training will be conducted by the National Imagery and Mapping Agency (NIMA) at Fort Belvoir, Virginia, under the training task prepared by the United States Army Engineer School (USAES).

LEGACY

INTERIM

OBJECTIVE

---

## Global Positioning System—Survey (GPS-S)

---



**DESCRIPTION:** The GPS-S provides real-time position, velocity, and timing (PVT) information to Army tactical and strategic organizations in stand-alone and embedded configurations. The GPS-S is used during peacetime, contingency, and wartime operations across all battlefield functional areas (BFAs) to provide worldwide, 24-hours-a-day, PVT data under adverse climatic and electronic conditions. User equipment will be configurable for use by the individual soldier; vehicles; weapon systems; and command, control, communications, computers, and intelligence (C4I) systems during ground, air, and sea operations.

**STATUS:** The GPS-S is fielded. The Signal School's GPS operational requirements document (ORD) is under revision. The requirement for the GPS-S was within the approved GPS ORD; therefore, it is important to be within the new GPS ORD with objectives at upgrading the instruments and software.

**EMPLOYMENT CONCEPT:** Corps and echelons-above-corps (EAC) levels.

**BASIS OF ISSUE:** Four to the United States (US) Army Engineer School (USAES), sixteen to the Defense Mapping School, and ten per special requirements code (SRC) 05607 Engineer Company (Topo) (EAC) and SRC 05068 Engineer Company (Topo) (Corps).

**TRAINING/PERSONNEL:** The GPS-S instruction for military occupational specialty (MOS) 82D (Topographic Surveyor) was added to the Defense Mapping School course at Fort Belvoir, Virginia.

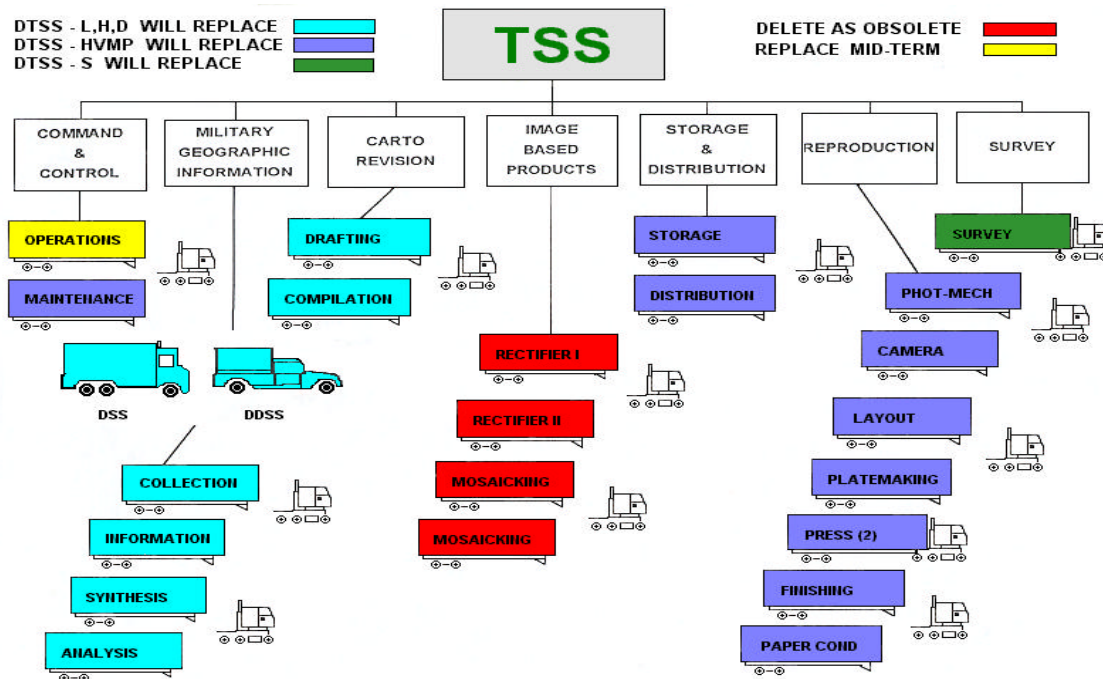
LEGACY

INTERIM

OBJECTIVE

---

## Topographic Support System (TSS)



**DESCRIPTION:** The TSS is the commercial-off-the-shelf (COTS) equipment currently used by topographic units. The equipment is housed in twenty-three 30-foot trailer containers and a 20-foot truck-mounted van unit. There are different modules and van configurations in the TSS, which make up the seven functional subsystems. A description of each subsystem follows:

- **Command and Control Subsystem.** Provides centralized control, direction, and management of the overall functions and provides capability to perform maintenance tasks on the TSS. This includes processing external requests defining requirements, assigning internal priorities, and managing operational activities.
- **Storage and Distribution Subsystem.** Provides a central location for storage of TSS data-bank material, maintains a system for location and retrieval of materials, finishes the package (trims, binds, and folds), forwards the products, and destroys sensitive materials.
- **Cartographic Revision Subsystem.** Prepares final drawings and reproduction materials for special-purpose graphics, drafts original overlays, and cartographically and photographically revises existing overlays for general-purpose graphics.
- **Reproduction Subsystem.** Provides the capability to perform all required sequential functions requisite to reproducing lithographic products.
- **Image-Based Products (IBPs) Subsystem.** Performs all photographic processing and transformations required, including differential and frame rectification, mosaicking, scale changes, and routine photographic reproduction.

## Fielded Systems – Topographic/Geospatial Engineering

- **Military Geographic Information (MGI) Subsystem.** Provides a storehouse and center for on-site terrain data collection, analysis, and synthesis for topographic support. This subsystem will be replaced by the Digital Topographic Support System—Light (DTSS-L).
- **Survey Subsystem.** Uses both conventional surveying and positioning concepts to intensify existing control networks in critical areas of military operations and to determine the location and elevation of points designated by the user.

**STATUS:** The TSS was fielded to the last topographic units in 1QFY87. Currently the United States (US) Army Engineer School (USAES), the Belvoir Research and Development Engineer Center, and the Troop Support Command are working together to update/replace the TSS with the DTSS, which will be an infusion of current technologies. Requirements to replace the TSS have been put into the DTSS operational requirements document (ORD). Funds have been put in the program objective memorandum (POM) to replace the TSS.

**EMPLOYMENT CONCEPT:** The TSS modules are used by engineer battalions (topographic), including their organic topographic companies, and by theater, corps, and division terrain teams.

**BASIS OF ISSUE:** All active Army and Army National Guard topographic units (special requirements code [SRC] 05607 and 05608) have received the TSS. In addition, the division terrain teams (tables of organization and equipment [TOEs] 05540LI and 05540LN) received either the Direct-Support System (1986-1987) or the Downsized Direct-Support System during 3QFY93.

**TRAINING/PERSONNEL:** The National Imagery and Mapping Agency (NIMA) has included TSS equipment in a variety of courses taught to enlisted and officer personnel.

LEGACY

INTERIM

OBJECTIVE

---

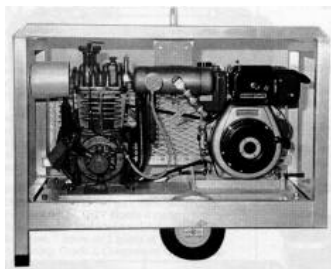
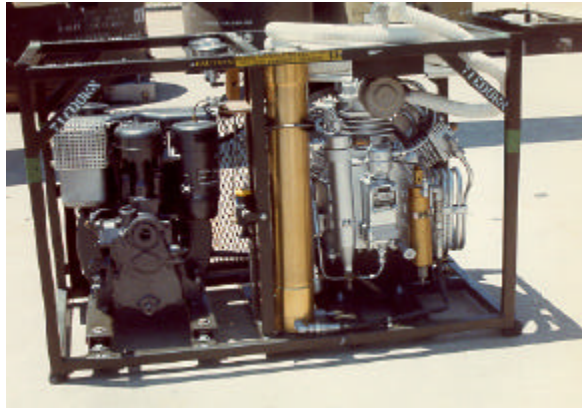
**Notes**

## **SECTION II**

### **FIELDDED SYSTEMS**

#### **Part 6. Diving**

**NOTE: Diving equipment is not identified as Legacy, Interim, or Objective since it is generally commercial-off-the-shelf (COTS) or Navy-procured equipment.**





## **Assault Boat, 7-Man (Inflatable)**

---



**DESCRIPTION:** The inflatable assault boat is fabricated from neoprene-coated nylon fabric. It is divided into eight separate air compartments. The assault boat comes equipped with paddles, air pumps, a carbon-dioxide (CO<sub>2</sub>) inflation system, and a repair kit. The stern of the boat is equipped for mounting a standard outboard motor, which is not provided with the boat.

**STATUS:** The technical design package was redesigned to reflect state-of-the-art technology. A contract was let in 1997 to Zodiac Incorporated.

**EMPLOYMENT CONCEPT:** The 7-man assault boat is used for special-operations stealth missions, over-the-horizon missions, river crossings, reconnaissance, and diving missions. The crew consists of one soldier. The boat can transport six combat-equipped special-operations soldiers or a 7-man engineer scuba team.

### **BASIS OF ISSUE:**

AMC	1
ARNG	81
8th USA	3
FORSCOM	23
SOC	260
TRADOC	62
USAREUR	9
USAPAC	3
USAR	9
Other Active Army	27
Total Required	478

**TRAINING/PERSONNEL:** Training is conducted during advanced individual training (AIT).

---

## Assault Boat, 15-Man (Inflatable)

---



**DESCRIPTION:** The inflatable assault boat is fabricated from neoprene-coated nylon fabric. It is divided into eight separate air compartments. The assault boat comes equipped with paddles, air pumps, and a repair kit. The stern of the boat is equipped for mounting a standard outboard motor, which is not provided with the boat.

**STATUS:** The technical design package was redesigned to reflect state-of-the-art technology. A 5-year contract was let in 1996 to Zodiac Incorporated.

**EMPLOYMENT CONCEPT:** The primary mission of the 15-man assault boat is to carry assault troops across rivers or other bodies of water. The crew consists of three soldiers. The boat can transport 12 combat-equipped infantrymen or 3,375 pounds of equipment. Another mission for the boat is to support engineer diving operations.

### BASIS OF ISSUE:

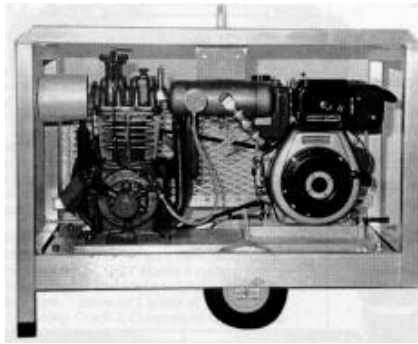
AMC	76
ARNG	277
8th USA	43
FORSCOM	178
TRADOC	6
USAREUR	32
USAPAC	32
USAR	199
Other Active Army	5
Total Required	848

**TRAINING/PERSONNEL:** Training is conducted during advanced individual training (AIT).

---

## **Compressor, Diving, 40 Cubic Feet Per Minute (cfm)**

---



**DESCRIPTION:** This system consists of two 40-cfm compressors that can operate separately in support of the Lightweight Diving Equipment Set, the Deep-Sea Diving Equipment Set, the Special Diver Air-Support System, and the Underwater Construction Set. The two compressors are used in a dual configuration to support the diver's recompression chamber.

**STATUS:** The 40-cfm compressors are being procured in 2000. Current equipment is rapidly becoming unsupportable. The old compressors provide 88.5 cfm. Although some activities require this, most operations can be fully supported by a smaller unit, minimizing undue wear and tear on equipment. The excessive weight of 5,000 pounds limits the ability to employ the equipment and far exceeds the current industry standards. The water-cooled engine contributes to the excessive weight and places unnecessary requirements on maintenance operations.

**EMPLOYMENT CONCEPT:** The new compressor will support all diving operations. It allows the dive unit to tailor equipment needs to the mission, maximize equipment use, and provide for multiple simultaneous dive missions according to current doctrine. The system enables dive teams to deploy with all necessary equipment to perform obstacle emplacement/reduction and battle-damage repairs of waterfront facilities, bridges, dams, vessels, and river-crossing sites.

**BASIS OF ISSUE:** Two per engineer heavy and light dive team.

**TRAINING/PERSONNEL:** This equipment is trained at the military occupational specialty (MOS) 00B producing school.

---

## Divers' Recompression Chamber

---



**DESCRIPTION:** Recompression chambers are used for surface decompression, treating decompression sickness, and administering pressure tests to prospective divers. Army recompression chambers are equipped for the hyperbaric administration of oxygen and can be used to treat carbon-monoxide poisoning, gangrenous tissue, and other diseases. Decompression-surface-supplied diving operations to depths greater than 130 feet require that a chamber be available at the dive site.

**STATUS:** The Diver Recompression Chamber program was overhauled during 1996 to 2000. The current chambers were fielded in 1984 with a service life of ten years. The need for modernization was identified during Operations Desert Shield/Storm in Southwest Asia, Uphold Democracy in Haiti, and Restore/Continue Hope in Somalia. A major flaw with the current model is the absence of internal environmental support systems. It also has no certification or standardization within the Army. In 1996, an overhaul program was initiated to modernize and containerize eight units in an effort to extend the service life by 15 to 20 years. Currently, the modernization program has been scrapped because of the cost comparison to commercially available equipment. Commercial equipment was found to be less expensive and met the required specifications. Solicitation for new units was forwarded in 2QFY00.

**EMPLOYMENT CONCEPT:** The overhaul program modernizes and containerizes the chambers, extending the service life 15 to 20 years. The updated equipment uses twenty-first century technology and corrects deficiencies previously identified. Dive units turn in the old chambers in exchange for a rebuilt chamber.

**BASIS OF ISSUE:** One per engineer dive team.

**TRAINING/PERSONNEL:** Operations and maintenance are taught at the military occupational specialty (MOS) 00B school.

---

## **Diving Equipment Set, Individual Swimmer Support Set**

---



**DESCRIPTION:** The individual swimmer support set is comprised of 21 components needed to conduct underwater operations. Some of the major items are a mask, fins, a wet suit, a life jacket, and a weight belt. This set is used in conjunction with the open- or closed-circuit scuba sets.

**STATUS:** The set was updated in 1995 with new components. The next update is scheduled for 2010.

**EMPLOYMENT CONCEPT:** This set supports special-operations scuba teams or engineer dive teams in conducting underwater reconnaissance, demolition, repair, light-salvage, and recovery missions.

**BASIS OF ISSUE:**

ARNG	72
8th United States Army	1
FORSCOM	98
TRADOC	19
USAPAC	18
USAR	24
Other Active Army	10

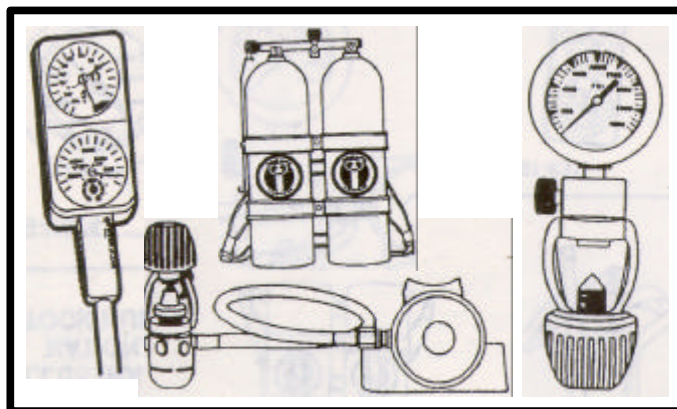
**NOTE: Nineteen per Engineer Dive Team (Light), 22 per Engineer Dive Team (Heavy), and 30 per Special-Operations Battalion.**

**TRAINING/PERSONNEL:** Training is conducted at Department of Defense (DOD) dive schools.

---

## Diving Equipment Set, Open-Circuit Scuba

---



**DESCRIPTION:** The open-circuit scuba system is comprised of four major components—a single-hose demand regulator, an underwater pressure gauge, a twin set of 80-cubic-foot cylinders, and a cylinder pressure gauge.

**STATUS:** The set was updated in 1994 with new components. The next update is scheduled for 2008.

**EMPLOYMENT CONCEPT:** This set supports special-operations scuba teams or engineer dive teams in conducting underwater reconnaissance, demolition, repair, light salvage, and recovery missions.

### BASIS OF ISSUE:

ARNG	114
8th USA	1
FORSCOM	98
TRADOC	12
USAPAC	27
USAR	24
Other Active Army	10

**NOTE:** Nineteen per Engineer Dive Team (Light), 22 per Engineer Dive Team (Heavy), and 30 per Special-Operations Battalion.

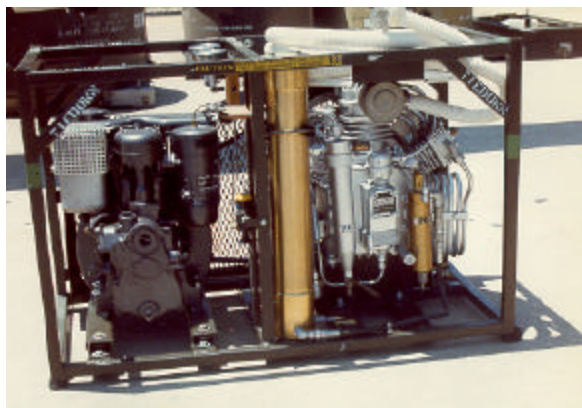
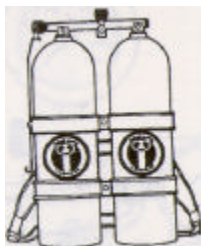
**TRAINING/PERSONNEL:** Training is conducted at Department of Defense (DOD) dive schools.

---



## **Diving Equipment Set, Scuba Support, Type A**

---



**DESCRIPTION:** The set consists of a mobile, compressed-gas servicing unit; a 20-cubic-feet-per-minute (cfm) high-pressure compressor; an oxygen booster pump; a charging manifold system; and other associated equipment needed for both open- and closed-circuit scuba operations.

**STATUS:** The Type-A Set was updated in 1996 to 1997 with a new compressor. The next update is scheduled for 2007.

**EMPLOYMENT CONCEPT:** This set supports seven-man special-operations scuba teams or engineer dive teams in conducting underwater reconnaissance, demolition, repair, light salvage, and recovery missions.

**BASIS OF ISSUE:**

ARNG	6
FORSCOM	10
SOC	19
TRADOC	10
USAPAC	2
USAR	3
Other Active Army	1
Total Required	51

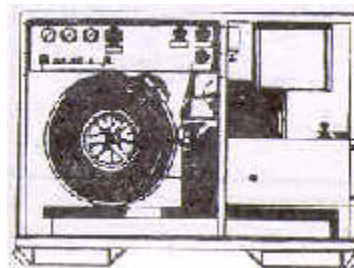
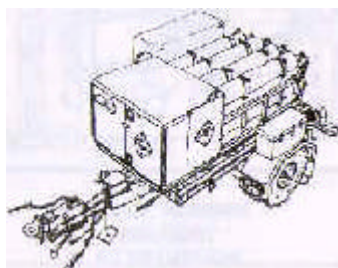
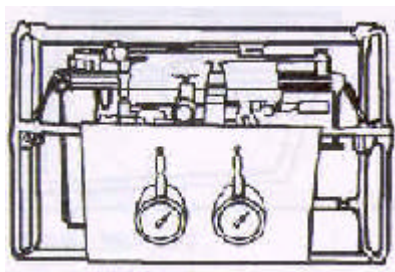
**NOTE: 2 per Engineer Dive Team and 3 per Special-Operations Group.**

**TRAINING/PERSONNEL:** Training is conducted at Department of Defense (DOD) dive schools.

---

## Diving Equipment Set, Scuba Support, Type B

---



**DESCRIPTION:** The Diving Equipment Set, Scuba Support, Type B consists of one mobile, compressed-gas servicing unit; one 20-cubic feet per minute (cfm) high-pressure compressor; an oxygen-booster pump; a charging manifold system; and other associated equipment needed for both open- and closed-circuit scuba operations. This set supports seven-man special-operations scuba teams or engineer dive teams in conducting underwater reconnaissance, demolition, repair, light salvage, and recovery missions.

**STATUS:** The new Diving Equipment Set, Scuba Support, Type B is being slated for modification using research, development, test, and evaluation (RDT&E) funds in 2002 with procurement in 2003.

**EMPLOYMENT CONCEPT:** The Diving Equipment Set, Scuba Support, Type B enables engineer dive teams to deploy with all necessary diving equipment to perform the following critical missions with minimal outside support: hydrographic surveys; obstacle emplacement or reduction; battle-damage assessment; repair to waterfront facilities, bridges, dams, and vessels; and support for river-crossing sites.

### BASIS OF ISSUE:

ARNG	7
FORSCOM	10
SOC	16
USAPAC	2
USAR	3
Total Required	38

**TRAINING/PERSONNEL:** This set will be taught at the military occupational specialty (MOS) 00B school.

---

## **Special Divers' Air-Support System (SDASS)**

---



**DESCRIPTION:** The SDASS supports extended diving operations or the secondary life-support air-source requirements for Army recompression chambers. The SDASS provides breathing air to divers by accepting air from any of three separate air sources and properly distributing the air to one, two, or three divers at a maximum of 250 feet of water. The system provides constant depth monitoring of the divers by topside support personnel. This is the first engineer diving equipment in the modernization plan that supports a modularization concept. The service life for this equipment is indefinite due to the ability to upgrade and modernize the system's individual components.

**STATUS:** Fielding was completed in 1995.

**EMPLOYMENT CONCEPT:** The SDASS is employed in division, corps, and theater Army areas to support engineer divers during construction, salvage, repair, and emergency diving missions.

**BASIS OF ISSUE:** One per engineer diving team.

**TRAINING/PERSONNEL:** This system is trained at the 00B military occupational specialty (MOS) producing school.

---

## Surface-Supplied Diving Set (SSDS)

---



**DESCRIPTION:** The SSDS consists of eight deep-sea and eight lightweight helmet assemblies that keep the divers' heads dry and provide communications with topside surface personnel. The suit assembly (dry suit) affords maximum thermal and physical protection by keeping the diver completely dry. An umbilical assembly supplies breathing air, communications, depth monitoring, and a strength member supporting the diver's weight. The communication system allows three divers and the diving supervisor on the surface to intercommunicate. An emergency air supply that is worn on the diver's back provides enough air in reserve for the diving supervisor to abort the dive and bring the diver to the surface. The SSDS additionally contains an underwater video system that mounts to the helmet, allowing surface personnel to direct and record the mission, and a set of lightweight masks used for enclosed-space and shallow-water missions. The SSDS is used to a maximum depth of 250 feet and is the only system that protects the diver while in contaminated/polluted water.

**STATUS:** New SSDSs are being procured throughout FY01 and FY02.

**EMPLOYMENT CONCEPT:** The SSDS enables engineer dive teams to deploy with all necessary diving equipment to perform the following critical missions with minimal outside support: hydrographic surveys; obstacle emplacement and/or reduction; battle-damage assessment; repair to water-front facilities, bridges, dams, and vessels; and support for river-crossing sites.

### BASIS OF ISSUE:

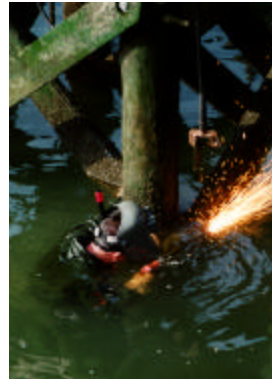
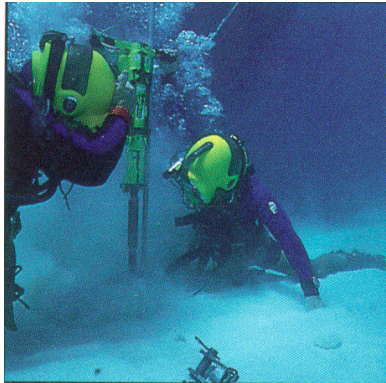
Engineer Diving Team (Heavy Team)	2
Light Team	4
USAES	1
Depot	1
Total required:	8

**TRAINING/PERSONNEL:** This set will be taught at the 00B military occupational specialty (MOS) producing school.

---

## **Underwater Construction Set (UCS)**

---



**DESCRIPTION:** The UCS consists of specific engineer diver-mission tools and equipment within an intermediate-sized quadruple container (QUADCON). Box one contains a hydraulic-tool package used for construction and debris removal and for cutting concrete, wood, and metal. Box two contains a cutting and welding package used for surface or underwater operations. Box three contains a salvage package used for lifting heavy debris and recovering objects up to 160,000 pounds. Box four contains hand tools, hardware, and equipment used to survey and mark underwater obstacles.

**STATUS:** The new UCS is being procured and containerized throughout FY01. The current set does not have a power source; tools and equipment required to cut concrete, wood, earth, and metal; equipment to move or recover heavy objects; or equipment to locate underwater obstacles and objects. Army divers have been forced to rely on locally procured or borrowed equipment to perform their missions.

**EMPLOYMENT CONCEPT:** The UCS enables dive teams to deploy with all necessary tools and equipment to perform hydrographic surveys; obstacle emplacement or reduction; assessment of battle damage; repair to waterfront facilities, bridges, dams, and vessels; and support for river-crossing sites, all with minimal outside support. The UCS can be used in freshwater or saltwater to a maximum depth of 250 feet. Each subsystem of the UCS is capable of operating independently, enabling the engineer light and heavy dive teams to tailor equipment packages for multiple and/or simultaneous missions.

**BASIS OF ISSUE:** One set per engineer dive team.

**TRAINING/PERSONNEL:** This set is taught at the 00B military occupational specialty (MOS) producing school.

---

## Underwater Photographic-Support Set

---



**DESCRIPTION:** The Photographic Support Set is based on a 35-millimeter (mm) still-photography format. The set consists of a 35-mm camera, a strobe light, and mounting hardware. It requires additional resources for film development. The photography is used for reconnaissance, inspection, and damage-assessment capabilities. The set can be used to a depth of 165 feet of water.

**STATUS:** New Photographic Support Sets are slated for modernization using research, development, test, and evaluation (RDT&E) funds in 2004, with procurement in 2005.

**EMPLOYMENT CONCEPT:** The Photographic Support Set enables engineer dive teams to deploy with all necessary diving equipment to perform the following critical missions with minimal outside support: hydrographic surveys; obstacle emplacement or reduction; battle-damage assessment; repair to waterfront facilities, bridges, dams, and vessels; and support for river-crossing sites.

### BASIS OF ISSUE:

ARNG	6
FORSCOM	10
TRADOC	3
USAPAC	2
USAR	3
Other Active Army	1
Total required	25

**TRAINING/PERSONNEL:** This set is taught at the 00B military occupational specialty (MOS) producing school.

---



**Notes**

## **SECTION II**

### **FIELDDED SYSTEMS**

#### **Part 7. Demolitions**



### 40-Pound Cratering Charge (1992 Version)

---

**CHARACTERISTICS:** The new 40-pound cratering charge (formerly called the 40-pound ammonium-nitrate block demolition charge) is about the same size and shape and has the same steel-encased construction as its predecessor. Internally, the explosive has been changed to a modern, more powerful and less moisture-sensitive H6 composition. The main charge is 40 pounds of H6 with a booster charge of 0.43 pound of composition A5 positioned at the top of the main charge to facilitate priming from the top. Two priming tunnels are located on the top surface of the charge along with a steel lifting handle. This facilitates easy lowering of the charge into boreholes. The new charge is packed in a protective metal M18A2 propelling-charge container with special inside padding. This charge must be dual primed with two M112 composition C4 (C4) charges, one charge on each side of the cratering charge.

**USE:** The new 40-pound cratering charge is suitable for cratering and ditching operations. It has been designed as a standard cratering charge but can also be used in destroying buildings, fortifications, and bridge abutments.

**ADVANTAGES:** The charge's size and shape make it ideal for cratering operations. It is inexpensive to produce compared to other explosives.

**LIMITATIONS:** The new 40-pound cratering charge is not moisture sensitive like its predecessor but it still needs to be dual primed. The new charge is a bit more sensitive to impact damage than the old one. A severe drop could crack the explosive and cause partial functioning when the charge is initiated. For this reason, the new charge should be kept in its protective metal shipping container until it is as close to the point of deployment as practical.

LEGACY

INTERIM

OBJECTIVE

---

### Adhesive Paste, M1

---

**CHARACTERISTICS:** The M1 adhesive paste is a sticky, putty-like substance used for attaching charges to vertical or overhead flat surfaces. It is useful for holding charges while tying them in place or, under some conditions, holding charges without tying.

**LIMITATIONS:** The M1 adhesive paste does not adhere satisfactorily to dirty, dusty, wet, or oily surfaces. The M1 adhesive paste is softened by water and becomes useless.

LEGACY

INTERIM

OBJECTIVE

---

## Blasting-Cap Holder, M8

---

**CHARACTERISTICS:** The M8 blasting-cap holder is a metal clip designed to attach and hold a blasting cap to a sheet explosive. It is supplied with the M118 sheet-demolition charge and the M186 roll-demolition charge. The M8 blasting-cap holder is also available as a separate item of issue in quantities of 4,000. It is compatible with the current modernized-demolition-initiator (MDI) system.

LEGACY

INTERIM

OBJECTIVE

---

## Blasting Caps

---

**CHARACTERISTICS:** Blasting caps are used for detonating high explosives. There are two types of blasting caps—electric and nonelectric. They are designed for insertion into cap wells and are also the detonating element in certain firing devices. Blasting caps are rated in power according to the size of their main charge. Special military blasting caps (M6 electric and M7 nonelectric) are used to ensure positive detonation of the generally less sensitive military explosives. Their main charge is about double that of the commercial No. 8 blasting cap. Both military and commercial blasting caps are extremely sensitive and may explode unless handled carefully. They must not be tampered with and must be protected from shock and extreme heat.

**USE:**

Electric blasting caps. Electric blasting caps are used when a source of electricity, such as a blasting machine or a battery, is available. Military caps are instantaneous. Electric caps have lead wires of various lengths for connection into a circuit. The lead wires most commonly used are 12 feet long. For ignition, electric caps require one and one-half amperes of electricity passing through their wires.

Nonelectric blasting caps. These caps may be initiated by time blasting fuse, a firing device, and detonating cord. The M7 special nonelectric blasting caps are flared at the open end for easy insertion of the time fuse.

**ADVANTAGES:** Both caps are designed to set off less sensitive military explosives.

**LIMITATIONS:** Electric caps are radio-frequency (RF) sensitive and require lengthy firing wire. Nonelectric caps should not be used to prime charges placed underwater or in wet boreholes because they are difficult to waterproof.

**STATUS:** These blasting caps are for demonstration purposes only. They have been replaced by modernized-demolition-initiator (MDI) components for all demolition missions in the Army except in the special-operations-forces (SOF) and explosive-ordnance-disposal (EOD) communities.

LEGACY

INTERIM

OBJECTIVE

---

## Blasting-Cap Test Set, M51

---

**CHARACTERISTICS:** The M51 blasting-cap test set was developed to replace the blasting galvanometer for continuity testing of electrical firing circuits. The test set is a self-contained unit with a magneto-type impulse generator, an indicator lamp, a handle to activate the generator, and two binding posts for attachment firing leads. The test set is waterproof and can be used at temperatures as low as -40°F.

**USE:** The continuity testing is completed by connecting the firing circuit to the test set's binding posts and depressing the handle sharply. If there is a continuous (intact) circuit—even one created by a short—the indicator lamp will flash.

**MAINTENANCE:** The test set should be handled with care and kept dry to assure optimum use. Before using, ensure that the set is in operating condition by connecting a piece of bare wire or the legs of the M2 crimpers between the binding post and depress the handle sharply while observing the indicator lamp. If the set is operative, the lamp will flash.

LEGACY

INTERIM

OBJECTIVE

---

## Blasting Machines

---

**CHARACTERISTICS:** Blasting machines and demolition firing devices are used to provide the electric impulse needed in electric blasting operations. The family of blasting machines includes six models—three models derive their power directly from a shunt-wound direct-current (DC) generator; two models, the M32 and M34, derive their power from an alternator and use a capacitor discharge output circuit; and one model, the M122 demolition firing device, remotely initiates explosives by means of a coded radio signal radiated by its transmitter to the receiver located at or near the explosives.

**TYPE:**

10-Cap Blasting Machine (older type). This small DC electric generator produces adequate current (1.5 amperes) to initiate 10 electric caps connected in a series if the handle is rotated to the end of its travel. The 10-cap blasting machine weighs about 5 pounds.

M32 10-Cap Blasting Machine. This small, lightweight blasting machine produces adequate current (1.5 amperes) to initiate 10 electric caps connected in a series.

M34 50-Cap Blasting Machine. This small, lightweight machine produces adequate current to initiate 50 electric caps connected in a series. It looks like the M32 blasting machine except for a black band around the base and a steel-reinforced actuating handle. The testing and operation of the M34 is done the same way as the M32.

LEGACY

INTERIM

OBJECTIVE

---

## Cap Crimper, M2

---

**CHARACTERISTICS AND USE:** The M2 cap crimper is used to squeeze the shell of a nonelectric blasting cap around a time blasting fuse, a standard base, or a detonating cord securely enough to keep it from being pulled off but not tightly enough to interfere with the burning of the powder train in the fuse or the detonation of the detonating cord. A stop on the handle limits the closing of the jaws to prevent this. The M2 crimper forms a water-resistant groove completely around the blasting cap. A sealing compound is applied to the crimped end of the blasting cap for use underwater. The rear portion of each jaw is shaped and sharpened for cutting fuses and detonating cords. One leg of the handle is pointed for use in punching cap wells in explosive materials for easy insertion of the blasting caps. The other leg has a screwdriver end. Cap crimpers are made of a soft, nonsparking metal that will conduct electricity. They must not be used as pliers because such use damages the crimping surface.

LEGACY

INTERIM

OBJECTIVE

---

## Composition C4 M112 Block Demolition Charge

---

**CHARACTERISTICS:** The M112 block demolition charge consists of 1.25 pounds of composition C4 (C4) packed in a Mylar-film container with pressure-sensitive adhesive tape on one surface. The tape is protected by a peelable paper cover. The C4 is white and is packed in an olive-drab, Mylar-film container. The relative effectiveness factor is 1.34.

**USE:** The M112 block demolition charge is used primarily for cutting and breaching in all types of demolition work. Because of its moldability and high brisance, the charge is ideally suited for cutting irregularly shaped targets such as steel. The adhesive backing allows the charge to be attached to any relatively flat, clean, dry surface that is above the freezing point.

**ADVANTAGES:** The M112 block demolition charge can be cut and molded to fit irregularly shaped targets while being easily attached to the target. The color of the wrapper aids in camouflage.

**LIMITATIONS:** The charge's odd weight makes calculating charge weights difficult. Adhesive tape will not adhere to wet, dirty, rusty, or frozen surfaces. The C4 explosives are poisonous and dangerous if chewed or ingested; their detonation or burning produces poisonous fumes.

**STATUS:** The M112 block demolition charge is in production to support peacetime losses. The C4 will replace current stocks of trinitrotoluene (TNT) and military dynamite.

LEGACY

INTERIM

OBJECTIVE

---



## Composition C4 M118 Block Demolition Charge

---

**CHARACTERISTICS:** The M118 block demolition charge, or sheet explosive, is a block of four 0.50-pound sheets of flexible explosive packed in a plastic envelope. Twenty M118 charges and a package of 80 M8 blasting-cap holders are packed in a wooden box. Each sheet of the explosive has a pressure-sensitive adhesive tape attached to one surface. Its relative effectiveness factor is 1.14.

**USE:** The M118 block demolition charge is designed as a cutting charge to be used especially against steel targets. The sheets of explosive can be quickly applied to irregular and curved surfaces and easily cut to any desired dimensions. The M118 demolition charge may be used for small breaching charges but should not be used as a bulk explosive charge because of its high cost.

**ADVANTAGES:** The sheets' flexibility and adhesive backing allow them to be applied to a large variety of targets. The 0.50-pound sheets can be cut to the desired dimensions and applied in layers to achieve the desired thickness. They are not affected by water and may be used in underwater demolitions.

**LIMITATIONS:** Adhesive tape will not adhere to wet, dirty, rusty, or frozen surfaces. These sheet explosives should be cut with a sharp steel knife on a nonsparking surface. Shears should not be used. Composition C4 explosives are poisonous and dangerous if chewed or ingested; their detonation or burning produces poisonous fumes.

LEGACY

INTERIM

OBJECTIVE

---

## Delay-Firing Device, M1

---

**DESCRIPTION:** The M1 delay-firing device is a chemically timed mechanical device. It has one identification and safety strip. The delay times range from 1 minute to 23 days. These time ranges are identified by the color of the safety strip.

**USE:** A nonelectric blasting cap is crimped onto the end of a device, and then the device is placed into a demolition charge. The next step is to crush the glass ampule (located in the opposite end of the device from the blasting cap), releasing a corrosive chemical. The chemical eats through the tension wire, releasing the firing pin that strikes and ignites the primer that, in turn, ignites the nonelectric cap.

LEGACY

INTERIM

OBJECTIVE

---

## Demolition-Charge Assembly, M183

---

**CHARACTERISTICS:** The M183 demolition-charge assembly or satchel charge consists of 16 M112 composition C4 demolition blocks and four priming assemblies for a total explosive weight of 20 pounds. The demolition blocks are packed in two bags, eight blocks per bag. The bags are then placed in an M85 canvas carrying case. One assembly is packed in a canvas carrying bag, and two bags are packed in a wooden box. Each priming assembly consists of a 5-foot length of detonating cord with a rapid-detonating-explosive (RDX) booster crimped to each end and a pair of M1 detonating-cord clips for attaching the priming assembly to the detonating-cord main line.

**USE:** The M183 demolition-charge assembly is used primarily in breaching obstacles or demolishing structures where large demolition charges are required. It is also effective against obstacles such as small dragon's teeth that are about 3 feet high and 3 feet wide at the base. The M183 demolition-charge assembly replaces the M37 demolition-charge assembly as the standard item of issue.

**DETONATION:** Detonation of the M183 demolition-charge assembly is done by means of a priming assembly and a nonelectric blasting cap or by the detonating-cord ring main attached by means of the detonating-cord clips provided.

**ADVANTAGES:** The M183 demolition-charge assembly can be taken apart, and the M112 C4 charges can be used separately.

**LIMITATIONS:** The limitations are the same as the M112 C4 charge. The M183 demolition-charge assembly is no longer being produced for the Army. Current stocks will be exhausted without being replaced. If a large charge is required, one can be made from regular C4 blocks.

LEGACY

INTERIM

OBJECTIVE

---

## Destructors

---

**DESCRIPTION:** The M10 destructor is a high-explosive charge in an assembled metal device. It is initiated by blasting caps or mine activators with standard firing devices. The destructor's primary function is the conversion of loaded projectiles and bombs to improvised demolition charges and the destruction of abandoned ammunition.

The M19 explosive destructor consists of an explosive-filled cylindrical body with a removable tip assembly that may be discarded if it is not needed. This destructor can be primed with a delay detonator, a delay-firing device with a high-output blasting cap, a nonelectric high-output blasting cap initiated by time blasting fuse or detonating cord, or an electric high-output blasting cap. The cap well on each end is threaded to receive the standard base coupling or priming adapter. This device is particularly suitable for use as a dust initiator and similar charges.

LEGACY

INTERIM

OBJECTIVE

---

## Detonating Cord

---

**CHARACTERISTICS:** Detonating cord is a core of pentaerythrite tetranitrate (PETN) or rapid detonating explosive (RDX) in a reinforced and waterproof olive-drab plastic coating. It will transmit a detonating wave from one point to another at a rate between 20,000 and 24,000 feet per second (fps). A partially submerged, water-soaked detonating cord will detonate if initiated from a dry end.

**USE:** Use detonating cord to prime and detonate other explosive charges. When its explosive core is detonated by a blasting cap or other explosive device, it will transmit the detonation wave to an unlimited number of explosive charges.

**ADVANTAGES:** Detonating cord can also be used as an explosive item by cutting the target and placing several wraps around the item.

**LIMITATIONS:** Although it does not lose its explosive properties by exposure to low temperatures, the covering becomes stiff and cracks when bent. Great care is required in using detonating-cord primers in arctic conditions.

LEGACY

INTERIM

OBJECTIVE

---

## Detonating-Cord Clip, M1

---

**CHARACTERISTICS:** The M1 detonating-cord clip is a device that is used to hold together two strands of detonating cord either parallel or at right angles to each other. Connections are made more quickly with these clips than with knots. If left in place any length of time, knots may loosen and fail to function properly.

LEGACY

INTERIM

OBJECTIVE

---

## Detonators

---

**CHARACTERISTICS:**

**M1A2 15-Second-Delay Percussion Detonator.** The M1A2 detonator consists of a firing-pin assembly joined to a delay housing and primer-holding assembly. To install the percussion detonator, remove the cap protector and screw the device into the threaded cap well of the demolition block or explosive device.

**M2A1 8-Second-Delay Percussion Detonator.** With the exception of the 8-second delay period and the marking and shape of the pull ring, the M2A1 delay is the same as the M1A2 15-second-delay percussion detonator.

**M1 Concussion Detonator.** The M1 concussion detonator is a mechanical firing device actuated by the concussion wave of a nearby blast. It fires several charges simultaneously without connecting them with wire or detonating cord. A single charge fired in water or air will detonate all charges primed with concussion detonators within range of the main charge or of each other. The detonator base is threaded to fit all standard cap wells in demolition blocks and explosive devices. While detonators often work at ranges greater than they were designed for, their reliability is not ensured. For safety reasons, this detonator should not be used in surf at depths greater than 15 feet. Further, if the salt delay pellet is crumbled from long storage, the detonator should not be used on underwater charges.

LEGACY

INTERIM

OBJECTIVE

---

Firing Wire and Reels

**CHARACTERISTICS AND USE:** The firing wire for firing electric charges is issued in 500-foot coils. The two-conductor American wire gauge (AWG) No. 18 is a plastic- or rubber-covered wire. It is carried on reel unit RL39A. The single-conductor AWG No. 20 annunciator wire is issued in 200-foot coils and is used for making connections between the blasting caps and the firing wire. The WD-1/TT communication wire can also be used but it has a higher resistance. This increases the power requirement so that blasting machines cannot be used with the full-rated number of caps with this wire. As a rule of thumb, use 10 caps less than the machine rating for each 1,000 feet of WD-1 wire.

There are three types of reels applicable for military demolition usage—the RL39A reel, a 500-foot reel with detachable handles, and a 1,000-foot reel with detachable handles. The RL39A is a reel with a spool that accommodates 500 feet of wire, a handle assembly, a crank, an axle, and two carrying straps. The fixed end of the wire is extended from the spool through a hole in the side of the drum and fastened to two brass thumb-out terminals. The carrying handles are made of two U-shaped steel rods. A loop at each end encircles a bearing assembly, which is a brass housing with a steel center to accommodate the axle. The crank is riveted to one end of the axle, and a cotter pin is placed in the hole at the other end to hold the axle in place. The 500-foot reel with detachable handles is a metal drum mounted on an axle to which two detachable D-shaped handles are fastened. It is cranked by using the arm with the knob on the side of the drum. The 1,000-foot reel is similar to the 500-foot reel except that it has a capacity of 1,000 feet of firing wire.

**NOTE: The United States Army Engineer School (USAES) is currently waiting for the war reserve to be transitioned to 100 percent modernized demolition initiators (MDIs) before removing the wire and reels from the modified tables of organization and equipment (MTOEs).**

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

## Military Dynamite, M1

---

**CHARACTERISTICS:** The M1 military dynamite is a rapid-detonation-explosive (RDX)-based composite explosive containing no nitroglycerin. The M1 military dynamite is packaged in 1/2-pound, paraffin-coated, cylindrical paper cartridges that have a nominal diameter of 1.25 inches and a nominal length of 8 inches. The relative effectiveness factor is 0.92.

**USE:** The M1 military dynamite is used in military construction, quarrying, ditching, and combat demolition work. It is suitable for underwater demolitions.

**ADVANTAGES:** Military dynamite will not freeze in cold storage nor exude in hot storage. The composition does not absorb or retain moisture. Shipping containers do not require turning during storage. It is safer to store, handle, and transport than 60-percent commercial dynamite. Military dynamite may be used in combat areas.

**LIMITATIONS:** Military dynamite is reliable underwater only up to 24 hours. Because of its low sensitivity, sticks of military dynamite must be well compacted to ensure complete detonation of the entire charge. The M1 dynamite is not efficient as a cutting or breaching charge. There must not be any voids in loading boreholes with dynamite in quarrying operations. Military dynamite will eventually detonate if set afire in a confined space. Therefore, a secondary explosion can result from a borehole with a void in its loading. After the first blast, it may take up to 15 minutes for such an explosion to occur.

LEGACY

INTERIM

OBJECTIVE

---



## **Modernized Demolition Initiators (MDIs)**

---



**DESCRIPTION:** The MDIs are used to initiate all standard military demolition. They will replace all electric and nonelectric firing systems for conventional forces.

**STATUS:** The MDIs are currently type classified. Full-force fielding is complete. The current preplanned product improvement (P3I) is being conducted to improve the MDI system and alleviate the operational limitations currently imposed. The first units were equipped with the P3I devices in 3QFY00.

**EMPLOYMENT CONCEPT:** The MDIs will impact all demolition missions by giving the soldier a safer, easier, and faster method of accomplishing a demolition mission. All units that currently have a demolition mission will use the MDIs.

**BASIS OF ISSUE:** The MDI components are Class V items that are drawn as needed. Current demolition sets are being reviewed to see what can be deleted.

**TRAINING/PERSONNEL:** Fielding for the MDI impacts all combat and combat-support (CS) military occupational specialties (MOSs) that use Army demolitions. All demolition programs of instruction (POIs) have been updated.

LEGACY

INTERIM

OBJECTIVE

---

## Pressure-Sensitive Adhesive Tape

---

**CHARACTERISTICS:** This pressure-sensitive tape is replacing M1 adhesive paste and is superior in speed and ease of application as well as holding power. It is used to hold demolition charges to dry and clean wood, steel, or concrete.

**USE:** The tape is coated on both sides with pressure-sensitive adhesive and requires no solvent or heat to be applied. It is available in rolls 2 inches wide and 72 yards long.

**LIMITATIONS:** This tape does not adhere to dirty, dusty, wet, or oily surfaces. It should not be used when the surface temperature of the target is below freezing.

LEGACY

INTERIM

OBJECTIVE

---

## Priming Adapters, M1A4 and M1A4A1

---

**CHARACTERISTICS:** The M1A4 priming adapter is a plastic, hexagonal-shape device threaded to fit threaded cap wells and the M10 universal explosive destructor. A shoulder inside the threaded end is large enough for a time blasting fuse and detonating cord but too small for a military blasting cap. The adapter is slotted lengthwise to permit easy and quick insertion of the electric blasting cap's lead wires. The M1A4 replaces the M1A2 and M1A3 models, which have cylindrical bodies. The hexagonal-shaped M1A4 is easily handled by soldiers wearing arctic mittens.

The M1A4A1 priming adapter is the same as the M1A4, except the slit cut in the side of the adapter is wider to accept a shock tube. This makes the M1A4A1 compatible with modernized demolition initiators (MDIs) without having to unreel the MDI component to use the M1A4A1.

LEGACY

INTERIM

OBJECTIVE

---

## Shaped Demolition Charges

---

**CHARACTERISTICS:** Shaped demolition charges used in military operations are cylindrical blocks of high explosive that have a conical cavity in one end that directs the cone liner material into a narrow jet for penetration materials. It is not effective underwater since water in the conical cavity will prevent the high-velocity jet from forming. To obtain maximum effectiveness, locate the cavity at the specified standoff distance from the target and detonate the charge from the exact rear center of the charge. Conventional methods of dual priming are not applicable to shaped charges.

**TYPES:**

- **Fifteen-pound M2A3 shaped demolition charge.** The M2A3 charge contains about 9.5 pounds of composition B with a 50-50 pentolite booster weighing about 2 pounds. It is packed in a moisture-resisting molded fiber container. A cylindrical fiber base slips onto the end of the charge to provide a standoff distance. A cone of glass is used as a cavity liner.
- **Fifteen-pound M2A4 shaped demolition charge.** The M2A4 charge is the same as the M2A3 charge in performance but less sensitive to gunfire. It differs in the booster size and materials as follows: the 50-50 pentolite booster has been replaced by 50 grams of composition A3, and the main charge of composition B has been increased to maintain the same total weight as the M2A3 charge.
- **Forty-pound M3 shaped demolition charge.** The M3 shaped charge contains about 27.5 pounds of composition B with a 50-50 pentolite booster in a metal container. The cavity liner is made of metal. To obtain a standoff distance, a metal tripod is provided.
- **Forty-pound M3A1 shaped demolition charge.** The M3A1 charge is the same as the M3 charge in performance but less sensitive to gunfire. It differs in the booster size and material as follows: the 50-50 pentolite booster has been replaced by a booster of about 50 grams of composition A3, and the main charge of composition B has been increased to maintain the same total weight as the M3 charge.

**USE:** Shaped demolition charges are used primarily to bore holes in earth, metal, masonry, concrete, and paved and unpaved roads. Their effectiveness depends largely on their shape, the material of which they are made, the explosive used, and proper placement.

LEGACY

INTERIM

OBJECTIVE

---

## Supplementary Adhesive for Demolition Charge

---

**CHARACTERISTICS:** The supplementary adhesive is used to hold demolition charges when the target surface is below freezing, wet, or underwater. The adhesive is issued in a tube in water-resistant cardboard slide boxes, packaged with wooden applicators, and shipped 150 boxes in a fiberboard container.

**USE:** Apply the adhesive to the target surface with a wooden applicator and a demolition block with or without pressure-sensitive tape placed on top.

LEGACY

INTERIM

OBJECTIVE

---

## Time Blasting Fuse

---

**CHARACTERISTICS:** The time blasting fuse transmits a flame from a match or igniter to a nonelectric blasting cap or other explosive charge after providing a time delay. This delay allows the soldier to retire to a safe distance before the explosion. There are two interchangeable types of fuses—the safety fuse and the M700 time fuse.

**USE:** The safety fuse is used in general demolitions. It consists of black powder tightly wrapped with several layers of fiber and waterproofing material. It may be any color, but orange is the most common. The burning rate may vary for the same or different rolls from 30 to 45 seconds per foot under different atmospheric and climatic conditions. Before using the safety fuse, it is recommended that you test each roll in the area where the charge is to be placed. Take particular precautions if using it underwater, as the rate of burning is increased significantly. Test each roll underwater before preparing the charge.

The M700 fuse is a dark green cord 0.2 inch in diameter with a plastic cover. Depending on the time of manufacture, the cover may be smooth or have single yellow bands around the outside at 12- or 18-inch intervals and double yellow bands at 5-foot or 90-inch intervals. These bands are provided for easy measuring. The burning rate is about 40 seconds per foot. Test the burning rate in the same way as the safety fuse.

**NOTE:** The M700 time fuse has been replaced for general demolition missions by the M14 in the modernized-demolition-initiator (MDI) system.

**ADVANTAGES:** The delay allows the soldier to retreat to a safe distance before the main charge explodes.

**LIMITATIONS:** The outside covering becomes brittle and cracks easily in arctic temperatures.

**PACKAGING:** Safety fuse is packaged in 50-foot coils, two coils per package, with 30 packages (3,000 feet) in a wooden box. The M700 time fuse is packaged in 50-foot coils, two coils per package, five packages sealed in a metal can, with eight cans (4,000 feet) per wooden box.

LEGACY

INTERIM

OBJECTIVE

---

## Trinitrotoluene (TNT) Block Demolition Charge

---

**CHARACTERISTICS:** The TNT block demolition blocks are issued in three sizes. The 0.25-pound block is issued in a cylindrical, waterproof, olive-drab cardboard container. The 0.50-pound and 1-pound blocks are issued in similar rectangular containers. All three charges have metal ends with a threaded cap well in one end. Their effectiveness factor is 1.0.

**USE:** The TNT block demolition charges are standard demolition charges used for all types of demolition work. However, the 0.25-pound charge is used primarily for training purposes.

**ADVANTAGES:** The TNT block demolition charges have a high detonating velocity. They are stable, relatively insensitive to shock or friction, and water-resistant. They are also convenient in size, shape, and packaging.

**LIMITATIONS:** The TNT block demolition charges cannot be molded and are difficult to use on an irregular-shaped target. The TNT is not recommended for use in closed spaces because its explosion produces poisonous gases.

**STATUS:** The TNT procurement ceased in FY85. Current stocks will be used until exhausted. Composition C4 is the only demolition block that will be bought in the future.

LEGACY

INTERIM

OBJECTIVE

---

## Waterproof Sealing Compound

---

**CHARACTERISTICS:** This sealant is used to waterproof the connection between the time blasting fuse and a nonelectric blasting cap and to moisture-proof primed dynamite. It will not make a permanent waterproof seal and must not be submerged in water unless the charge is to be fired immediately. The sealant comes packaged in a 0.5-pint can.

LEGACY

INTERIM

OBJECTIVE

---

**SECTION III**

**SETS, KITS, AND OUTFITS**

**Part 1. Sets**



Bridge Conversion Set, Fixed Bridge

DESCRIPTION:

Line item number (LIN): C20688  
National stock number (NSN): 5420-00-267-0026  
Supply Catalog (SC) 5420-97-E29, dated 16 January 1996

PROPONENT: United States (US) Army Tank-Automotive and Armaments Command (TACOM).

PURPOSE: This set, when combined with standard M2 bailey-bridge components, will provide for the construction of one panel-crib pier having a maximum height of 31 feet 7 inches and a maximum capability of 145 tons. Panel-crib piers may be used for intermediate supports; through- and deck-type fixed bridges; piers in barge bridges; intermediate landing-bay piers in floating panel bridges with double landing bays; expedient towers for suspension bridges; lift bridges, gantries, and floating-bridge anchor cables; and expedient marine piers.

STATUS: There are currently 13 sets in the US Army, Europe (USAREUR) operational stock and 17 sets in Pacific operations.

TRAINING/PERSONNEL: No training is done at the institutional-training level.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

## Bridge Erection Set, Fixed Bridge: Highway; Pony Truss; Widened Roadway; Bailey Type; or Cable Reinforcement

---

**DESCRIPTION:**

Line item number (LIN): C22058  
 National stock number (NSN): 5420-00-530-3785  
 Supply Catalog (SC) 5420-97-E40 dated 3 September 1996

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** The Bridge Erection Set provides equipment that normally is used for erecting fixed simple-span, through-type bridges. The set contains the necessary equipment for erecting and launching two 80-foot, double-truss, single-story spans with launching nose. However, the basic erection equipment may be used to meet varying conditions of span or load in spans from 30 to 210 feet long. In addition, an auxiliary erection set may be used for various types of special construction such as the following:

- Panel-crib piers and towers.
- Two-lane, through-type bridges; deck-type bridges; railway bridges; and floating bridges.
- Expedient construction of causeways, box anchors, towers, floating-bridge cables, loading hoppers, and gantries.

**STATUS:** There are currently 43 erection sets in the US Army inventory. Nineteen sets are at the US Army Materiel Command (AMC); thirteen sets are with the National Guard; two sets are at the US Army Engineer School (USAES); one set is in the US Army, Europe (USAREUR) operational stock; one set is in Pacific operations; and seven sets are with the Army Reserves. There are no plans for further procurement of the Bridge Erection Set.

**TRAINING/PERSONNEL:** Currently trained at the institutional-training level.

LEGACY

INTERIM

OBJECTIVE

---

## Bridge Erection Set, Floating Bridge: Aluminum Deck Balk Superstructure

---

**DESCRIPTION:**

Line item number (LIN): C22195  
National stock number (NSN): 5420-00-292-9836  
Supply Catalog (SC) 5420-97-E09, dated 20 April 1974

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** The Float-Bridge Erection Set provides the necessary components to support the floating bridge. This set provides the tools and equipment necessary for erecting the bridge, floating: aluminum highway deck balk superstructure (M4T6), SC 5420-97-E35.

The pneumatic hose of this set provides support for the rotary air compressor, which is an associated item for the bridge set. Associated items pertaining to this set are listed in Army Regulation (AR) 71-13, DA Equipment Authorization and Usage Program.

**STATUS:** A total of eight sets are in the US Army inventory. Four sets are at the US Army Materiel Command (AMC) Depot Command; two sets are in the US Army, Europe (USAREUR) operational stock; one set is with the National Guard; and one set is with the Army Reserves.

**TRAINING/PERSONNEL:** No training is being conducted.

LEGACY

INTERIM

OBJECTIVE

---

## Bridge Erection Set, Floating Bridge: Class 60 With Steel Superstructure

---

**DESCRIPTION:**

Line item number (LIN): C22332  
National stock number (NSN): 5420-00-267-0029  
Supply Catalog (SC) 5420-97-E30, dated 20 August 1974

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This set provides the necessary components to support the Class 60 Floating-Bridge Erection Set and the necessary tools, equipment, and accessories for the erection and maintenance of the—

- Bridge, floating highway, Class 60, 600 feet, SC 5420-97-E03.
- Bridge, floating steel highway, Class 60, 135 feet, SC 5420-97-E46.

Associated items pertaining to this set are listed in Army Regulation (AR) 71-13, DA Equipment Authorization and Usage Program.

**STATUS:** There is currently one set in the US Army inventory at the US Army Materiel Command (AMC) Depot Command.

**TRAINING/PERSONNEL:** No training is being conducted.

LEGACY

INTERIM

OBJECTIVE

---

## Bridge Erection Set, Floating Bridge: Class 60 With Steel Superstructure or Floating Bridge With Aluminum Deck Balk Superstructure

---

**DESCRIPTION:**

Line item number (LIN): C26305  
National stock number (NSN): 5420-00-892-4596  
Supply Catalog (SC) 5420-97-E45, dated 19 June 1974

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This set provides the erection equipment and accessories for the erection and maintenance of the—

- Class 60 pneumatic float bridge with steel superstructure, SC 5420-97-E03.
- Pneumatic float bridge with aluminum deck balk superstructure, SC 5420-97-E35.
- Bridge, floating: steel highway, Class 60, 135 feet, SC 5420-97-E46.

This set is supplemented with one wrench set that includes a socket and a 3/4-inch square drive, NSN 5120-00-595-9151 (LIN Y75517). Refer to Army Regulation (AR) 71-13, DA Equipment Authorization and Usage Program, for a listing of associated items pertaining to this set.

**STATUS:** A total of 10 sets are in the US Army inventory; all 10 sets are in National Guard units.

**TRAINING/PERSONNEL:** No training is being conducted.

LEGACY

INTERIM

OBJECTIVE

---

## Bridge, Fixed: Highway, Aluminum, 38 Feet Long

---

**DESCRIPTION:**

Line item number (LIN): C22880  
National stock number (NSN): 5420-00-530-3773  
Supply Catalog (SC) 5420-97-E41, dated 11 February 1985

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This set provides the necessary components to support the fixed highway bridge and to allow the continuous passage of all vehicles. This set also provides the necessary components to build any of the following bridges:

- One 38-foot 4-inch, Class 45 to 60 wheeled or Class 35 to 50 tracked, depending on the amount of reinforcement.
- One 23-foot 4-inch, Class 120 wheeled or Class 100 tracked.
- One 15-foot fixed span, Class 120 wheeled or tracked.

**STATUS:** No inventory data is available.

**TRAINING/PERSONNEL:** No training is being conducted.

LEGACY

INTERIM

OBJECTIVE

---



## Bridge, Fixed: Highway; Pony Truss, Portable Panel; Widened Roadway; or Bailey Type

---

**DESCRIPTION:**

Line item number (LIN): C23017  
National stock number (NSN): 5420-00-530-378  
Supply Catalog (SC) 5420-97-E39, dated 1 March 1996

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This set provides equipment that is normally used for fixed, simple-span, through-type bridges. This set contains the necessary equipment to build two 80-foot, double-truss, single-story bridge spans. However, the basic equipment may be erected to meet varying conditions of span or load in spans from 30 to 210 feet long. In addition, an auxiliary erection set may be used for various types of special construction such as the following:

- Panel-crib piers and towers.
- Two-lane, through-type bridges; deck-type bridges; railway bridges; and floating bridges.
- Expedient construction of causeways, box anchors, towers, floating-bridge cables, loading hoppers, and gantries.

**STATUS:** There are a total of 89 sets in the US Army inventory. Sixty-one sets are at the US Army Materiel Command (AMC) Depot Command; thirteen sets are with the National Guard; eight sets are with the Army Reserves; three sets are in Pacific operations; two sets are at the US Army Engineer School (USAES); one set is in US Army, Europe (USAREUR) operational stock; and one set is with the Corps of Engineers.

**TRAINING/PERSONNEL:** No training is being conducted.

LEGACY

INTERIM

OBJECTIVE

---

## Bridge, Floating: Aluminum, Highway, Deck Balk Superstructure

---

**DESCRIPTION:**

Line item number (LIN): C25072  
National stock number (NSN): 5420-00-171-4519  
Supply Catalog (SC) 5420-97-E35, dated 10 July 1974

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This set provides the necessary components for the construction of—

- One 141-foot 8-inch long floating bridge having a capacity of Class 50 in 1-foot-per-second (fps) current velocity.
- Two 4-float ferries having a capacity of Class 60 in 5-fps current velocity.
- Two 75-foot floating bridges.
- One 38-foot 4-inch, fixed-span bridge.

Anchorage equipment is also contained in this set. Associated items supporting this set include—

- Two rotary air compressors, NSN 4310-00-542-3329, LIN E73626.
- One inflatable-craft repair kit, NSN 2090-00-724-8569, LIN R74476.
- One bridge erection set, float bridge: aluminum deck balk superstructure, NSN 5420-00-267-0029, LIN C22332.

**STATUS:** A total of 13 sets are in the US Army inventory. Nine sets are at the US Army Materiel Command (AMC) Depot Command; two sets are with the National Guard; one set is in the US Army, Europe (USAREUR) operational stock; and one set is with the Army Reserves.

**TRAINING/PERSONNEL:** No training is being conducted.

LEGACY

INTERIM

OBJECTIVE

---

Bridge, Floating: Raft Section, Light Tactical

DESCRIPTION:

Line item number (LIN): C25757  
National stock number (NSN): 5420-00-542-4719  
Supply Catalog (SC) 5420-97-E42, dated 30 December 1978

PROPONENT: The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

PURPOSE: This set provides equipment to the infantry division for assault stream crossing. It contains equipment for the construction of one 4-pontoon raft having a capacity of a Class 12 load in 8-feet-per-second (fps) current velocity, exclusive of propulsion units. Two or more sets of this equipment can be combined to construct a floating bridge having a Class 12 capacity in 7-fps current velocity. The set consists of eight half-pontoons which, when coupled together in pairs, will form the four floating supports for the superstructure. The superstructure consists of prefabricated panels capable of being rapidly assembled to provide for a Class 12 load up to 9 feet wide. Ramps capable of being articulated to accommodate different heights of riverbanks are included in the set. The 4-pontoon rafts can be erected in 15 minutes by manpower. Tests have shown that a helicopter can be used to carry one bay of a light tactical bridge to aid in raft and bridge construction. All components except for appurtenances are of lightweight alloy metal (aluminum alloy). Anchorage is also included in the set. The set is capable of being transported on two standard 2 1/2-ton military trucks and one 2 1/2-ton pole trailer.

STATUS: A total of eight sets are in the US Army inventory. Three sets are at the US Army Materiel Command (AMC) Depot Command; two sets are with the National Guard; two sets are in the US Army, Europe (USAREUR) operational stock; and one set is with the Army Reserves.

TRAINING/PERSONNEL: No training is being conducted.

LEGACY	INTERIM	OBJECTIVE
--------	---------	-----------

## Bridging Sets In Depot For Contingency Operations

LIN	DESCRIPTION	SC NUMBER	AMC MSC
C20688	Bridge Conv Set Bailey	SC-5420-97-E29	TACOM-WARREN
C22058	Bridge Erect Set Bailey	SC-5420-97-E40	TACOM-WARREN
C22195	Bridge Erect Set Fl Al	SC-5420-97-E09	TACOM-WARREN
C22332	Bridge Erect Set Fl Stl	SC-5420-97-E30	TACOM-WARREN
C22880	Bridge Fix Hw Al 38 Ft	SC-5420-97-E41	TACOM-WARREN
C23017	Bridge Fix Bailey	SC-5420-97-E39	TACOM-WARREN
C24935	Bridge Fl Alum Ft	SC-5420-98-E28	TACOM-WARREN
C25209	Bridge Fl Hw Cl 60/600	SC-5420-97-E03	TACOM-WARREN
C25346	Bridge Fl Hw Cl 60-135	SC-5420-97-E46	TACOM-WARREN
C25757	Bridge Fl Lgt Tact Raft	SC-5420-97-E42	TACOM-WARREN
C26305	Bridge Erect Set Fl Cl60	SC-5420-97-E45	TACOM-WARREN
H38787	Ferry Conv Set Raft	SC-5420-97-E05	TACOM-WARREN
L27241	Cable Reinforced Set	SC-5420-97-E50	TACOM-WARREN

These sets consist of bridging equipment no longer identified in requirements documents nor fielded but are stored in depot stocks for contingency operations. The supply catalogs (SCs) were updated in September 2000 and placed in the inactive file at the Logistics Support Agency.

LEGACY

INTERIM

OBJECTIVE

## Crushing and Screening Plant, 225 Tons Per Hour (TPH)

### DESCRIPTION:

Line item number (LIN): F49673  
 National stock number (NSN): 3820-00-527-8577  
 Supply Catalog (SC) 3820-98-E04, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This crushing, screening, and washing plant is capable of producing 150 to 225 TPH of various sized/graded aggregate for construction purposes. The above SC and NSN reflect the older 225-TPH unit that is being replaced by a smaller unit, the 150-TPH Crushing, Screening, and Washing Plant (CSWP). (The new CSWP, NSN 3820-01-435-5177, does not have a SC, but it uses the same LIN to state the requirement in the tactical operational requirement [TOR]/modified table(s) of organization and equipment [MTOE].)

LEGACY

INTERIM

OBJECTIVE

## Demolition Equipment Set, Explosive Initiating, Electrical and Nonelectrical

---

**DESCRIPTION:**

Line item number (LIN): F91490  
National stock number (NSN): 1375-00-047-3750  
Supply Catalog (SC) 1375-95-A03, dated 15 October 1994

**PROPONENT:** United States (US) Army Armored and Chemical Acquisition and Logistics Activity (ACALA).

**PURPOSE:** This set provides the necessary components to install and detonate an electrical or nonelectrical firing system. All electrical requirements for the operation of this set are fully met by the blasting machine, which is a component of this set.

LEGACY

INTERIM

OBJECTIVE

---

## Drafting Equipment Set: Battalion for Charts, Sketches, and Overlays

---

**DESCRIPTION:**

Line item number (LIN): G44569  
National stock number (NSN): 6675-00-641-3610  
Supply catalog (SC) 6675-95-N04, dated 1 September 2000

**PROPONENT:** General Services Administration (GSA), configuration controlled by the United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** The set is intended for use by draftsmen (military occupational specialty [MOS] 51, Technical Engineer Specialist) to create fine-line drawings, overlays, sketches, and charts.

LEGACY

INTERIM

OBJECTIVE

---

## Light Set, Chart Field

---

**DESCRIPTION:**

Line item number (LIN): L63583  
National stock number (NSN): 6230-00-299-6474  
Supply Catalog (SC) 6230-90-N01, dated 1 September 2000

**PROPONENT:** The United States (US) Army Communications-Electronics Command (CECOM).

**PURPOSE:** This light set provides battery-powered lamps for use within command posts (CPs) and tactical operating centers.

LEGACY

INTERIM

OBJECTIVE

---

## Light Set: General; Illumination, 15 Kilowatt (kW)

---

**DESCRIPTION:**

Line item number (LIN): L63857  
National stock number (NSN): 6230-00-299-7080  
Supply Catalog (SC) 6230-97-CL-E02, dated 1 September 2000

**PROPONENT:** The United States (US) Army Communications-Electronics Command (CECOM).

**PURPOSE:** The 15-kW light set is designed to distribute electric power to various service organizations such as field hospitals, mobile topographical units, military railway service headquarters, and comparable field installations. The system provides all equipment required to illuminate tents, shelters, houses, and such. Electrical requirements for operating this set are 15 kW, alternating current (AC), 60 Hertz (Hz), 115 volts (V). When the set is issued for Military Assistance Program (MAP) requirements, a 15-kW generator set is included.

LEGACY

INTERIM

OBJECTIVE

---



## Sets, Kits, and Outfits – Sets

### Mat Set, Landing, XM18 and XM19

---

#### DESCRIPTION:

Line item number (LIN): M15665  
National stock number (NSN): 5680-00-089-7260 [XM18]  
Supply Catalog (SC) 5680-97-E04, dated 26 September 1980  
NSN: 5680-00-089-5920 [XM19]  
SC 5680-97-E03, dated 8 May 1995

**PROPONENT:** United States (US) Army Aviation and Troop Command (ATCOM).

#### PURPOSE:

**XM18 Mat Landing Set.** This set contains the necessary number of mats and ancillaries capable of producing 125,000 square feet of surfacing for a forward C-130 aircraft-resupply airfield. The mats included in this set have been found to be suitable interim mat for use on tactical airfields in support of all aircraft except F-4. The mat is suitable for F-4 aircraft operation except in areas where the aircraft tires roll over the arresting cable and the mat.

**XM19 Mat Landing Set.** This set contains the necessary number of mats and ancillaries capable of producing 125,000 square feet of surfacing for a forward C-130 aircraft-resupply airfield. The mats in this set have been found to be satisfactory for constructing airfields in support of C-130 aircraft and all Army fixed- and rotary-wing aircraft. The mat is suitable for F-4 aircraft operation, except for an arrested landing or take off which require an aircraft hook.

LEGACY

INTERIM

OBJECTIVE

---

### Reinforcement Set, Medium Girder

---

#### DESCRIPTION:

Line item number (LIN): C27309  
National stock number (NSN): 5420-01-139-1503  
Supply Catalog (SC) 5420-98-E56, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** The reinforcement set will increase the military load classification (MLC) of the medium girder bridge (MGB) to a Class 60 at 103 feet with 12 bays and a Class 60 at 160 to 163 feet with 22 bays.

LEGACY

INTERIM

OBJECTIVE

---

## Shop Equipment, Cutting And Welding: Underwater, Electrical

---

**DESCRIPTION:**

Line item number (LIN): W67980  
National stock number (NSN): 4940-00-264-6205  
Supply Catalog (SC) 4940-95-B13, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** This set provides the necessary components to perform underwater metal-cutting, welding, and salvaging operations when used in conjunction with a shore- or ship-mounted arc welder. It is used by Army divers. Electrical power for this set is provided by the shore- or ship-mounted arc welder.

LEGACY

INTERIM

OBJECTIVE

---

## Sketching Set, Surveying: Military Field Sketching

---

**DESCRIPTION:**

Line item number (LIN): T63238  
National stock number (NSN): 6675-00-641-3632  
Supply Catalog (SC) 6675-95-N03, dated 1 September 2000

**PROPONENT:** The United States (US) Army Communications-Electronics Command (CECOM).

**PURPOSE:** The set is used to make field sketches to support field engineering work, reconnaissance, minefield recording, and surveying. This set is under review.

LEGACY

INTERIM

OBJECTIVE

---

## Sets, Kits, and Outfits – Sets

### Supplementary Set, Bridge

---

#### DESCRIPTION:

Line item number (LIN): U60216  
National stock number (NSN): 5420-00-071-5273  
Supply Catalog (SC) 5420-98-E51, dated 1 September 2000

**PROPONENT:** The United States (US) Army Aviation and Troop Command (ATCOM).

**PURPOSE:** The Bridge Supplementary Set is used to provide the ribbon bridge with a permanent shore anchor system. The maintenance equipment provided within the set is used to conduct the minimum maintenance required. The ribbon bridge, when erected, provides a continuous floating, modular bridge with integral superstructure and floating supports capable of safely crossing military load classification (MLC) 60 loads in currents up to 8 feet per second and MLC 80 loads as caution crossings. The rotary air compressor, LIN E73626, NSN 4310-00-542-3329, is an associated items supporting this set.

LEGACY

INTERIM

OBJECTIVE

---

### Surveying Set, General Purpose

---

#### DESCRIPTION:

Line item number (LIN): U70179  
National stock number (NSN): 6675-00-641-3639  
Supply Catalog (SC) 6675-97-E21, dated 1 September 1999

**PROPONENT:** The United States (US) Army Communications-Electronics Command (CECOM).

**PURPOSE:** This set provides general-purpose surveying equipment normally required for making military planimetric and construction surveys. Equipment is provided for establishing horizontal control by traverse leveling and vertical control by spirit leveling. It does not produce the required level of accuracy for conducting topographic surveys but it can use either the plane-table method or the transit stadia method.

**NOTE:** Pioneer equipment is not included in this set but normally is available in all engineer units to which this set is issued.

LEGACY

INTERIM

OBJECTIVE

---

## Surveying Set, Topographic Section

---

**DESCRIPTION:**

Line item number (LIN): U71275  
 National stock number (NSN): 6675-00-641-3600  
 Supply Catalog (SC) 6675-97-E28 dated 1 September 1999

**PROPONENT:** United States (US) Army Communications-Electronics Command (CECOM).

**PURPOSE:** This set provides surveying, drafting, computing, and office equipment suitable for use by engineer topographic surveyors in preparing sketches, drawings, and maps and furnishing geodetic control to the field artillery.

**NOTE:** The Surveying Set, Topographic, Supplemental, SC 6675-97-CL-E27, LIN U71138, has been combined with SC 6675-CL-E28.

LEGACY

INTERIM

OBJECTIVE

---

## Test Set, Asphalt

---

**DESCRIPTION:**

Line item number (LIN): V64463  
 National stock number (NSN): 6635-00-641-3642  
 Supply Catalog (SC) 6635-98-E03, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armament Command—Warren (TACOM-Warren).

**PURPOSE:** The asphalt test set is used to test the quality and density of asphalt paving material. This set is used in conjunction with the soil test set, SC 6635-98-E02, to test aggregates, asphalt materials, and asphalt paving. Electrical requirements for the operation of this set are 3 kilowatts (kW), alternating current (AC), 60 hertz (Hz), and 115 volts (V). A 3-kW generator set will be included when issued for Military Assistance Program (MAP) requirements only (NSN 6635-00-926-1251 for map use).

LEGACY

INTERIM

OBJECTIVE

---

## Sets, Kits, and Outfits – Sets

### Test Set, Concrete

---

**DESCRIPTION:**

Line item number (LIN): V71587  
National stock number (NSN): 6635-00-641-3641  
Supply Catalog (SC) 6635-98-E04, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Warren (TACOM-Warren).

**PURPOSE:** The concrete test set tests the quality of concrete used in construction. This set is used in conjunction with the soil test set, SC 6635-98-E02-HR, to test aggregates and concrete.

LEGACY

INTERIM

OBJECTIVE

---

### Test Set, Soil

---

**DESCRIPTION:**

Line item number (LIN): V92959  
National stock number (NSN): 6635-00-641-3643  
Supply Catalog (SC) 6635-98-E02, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** The soil test set tests the density and moisture content of soil at the construction site. It provides the components required in a soil-test field laboratory to determine soil trafficability, compression, or foundation stress.

LEGACY

INTERIM

OBJECTIVE

---

## Topographic Support Sets

---

LIN	DESCRIPTION	SC NUMBER	AMC MSC
MO8138	Topo Spt St, Map Layout	TM-3610-260	CECOM
P06082	Topo Set St, Plate Pro	TM-3610-259	CECOM
P32316	Topo Spt St, Photomech Pro	TM-3610-285	CECOM
P50154	Topo Spt St, Press Sec	TM-3610-287	CECOM
T01973	Topo Spt St, Analysis Sec	TM-6675-323	CECOM
T02041	Topo Spt St, Coll Sec	TM-6675-323	CECOM
T02109	Topo Spt St, Div Tm	TM-6675-326	CECOM
T02245	Topo Spt St, Finish Sec	TM-3610-253	CECOM
T02313	Topo Spt St, Paper Cond	TM-3610-252	CECOM
T03165	Topo Spt St, Dist Set	TM-6675-315	CECOM
T03233	Topo Spt St, Compilation	TM-6675-317	CECOM
T03673	Topo Spt St, Inform Sec	TM-6675-324	CECOM
T03809	Topo Spt St, Drafting	TM-6675-316	CECOM
T05613	Topo Spt St, Maintenance	TM-6675-328	CECOM
T05681	Topo Spt St, Opera Sec	TM-6675-313	CECOM
T05749	Topo Spt St, Rect II	TM-6675-320	CECOM
T05817	Topo Spt St, Stor/Ret	TM-6675-314	CECOM
T08523	Topo Spt St, MOS/Draft	TM-6675-321	CECOM
T08625	Topo Spt St, Rect I	TM-6675-319	CECOM
T67981	Topo Spt St, Survey	TM-6675-318	CECOM
T68049	Topo Spt St, Synthesis	TM-6675-325	CECOM
C82833	Topo Spt St, Camera Sec	TM-3610-257	CECOM

The topographic support sets are being replaced by the digital topographic support sets. Component lists are contained in the technical manuals as reproducible hand receipts.

LEGACY

INTERIM

OBJECTIVE

**Notes**



**SECTION III**

**SETS, KITS, AND OUTFITS**

**Part 2. Kits**

## Sets, Kits, and Outfits – Kits

### Other Kits

---

LIN	DESCRIPTION	SC NUMBER	AMC MSC
S78712	Service Kit Pl Xmsn Tm	SC-4940-95-A87	TACOM—RIA
S78722	Service Kit Power Plant	SC-4940-95-A88	TACOM—RIA
	LEGACY	INTERIM	OBJECTIVE

---

### Repair And Refilling Kit, Carbon-Dioxide Extinguisher

#### DESCRIPTION:

Line item number (LIN): R72484  
National stock number (NSN): 4210-00-828-4447  
Supply Catalog (SC) 4210-98-E17, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Warren.

**PURPOSE:** This set, kit, and outfit provides the necessary components for repairing hose and refilling carbon-dioxide fire extinguishers. This set is intended to be used by personnel who are school trained to perform the duties and tasks required of military occupational specialty (MOS) 51M, firefighter.

	LEGACY	INTERIM	OBJECTIVE
--	--------	---------	-----------

---

## Tool Kit, Carpenter: Engineer Platoon

---

### DESCRIPTION:

Line item number (LIN): W34511  
National stock number (NSN): 5180-00-293-2873  
Supply Catalog (SC) 5180-90-N09, dated 1 January 1992

**PROPONENT:** The United States (US) Army Logistics Support Activity.

**PURPOSE:** This kit provides hand tools used with less frequency than those in the squad carpenter set, used to repair those in the squad carpenter set, and used to supplement those in the squad carpenter set.

**NOTE:** An upgrade to this set provides 18-volt battery-powered tools for the completion of carpentry-related tasks and is intended to supplement the squad carpenter's tool kit. This upgraded set can be obtained through the General Services Administration (GSA) using NSN 5180-01-447-2199.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Carpenter: Engineer Squad

---

### DESCRIPTION:

Line item number (LIN): W34648  
National stock number (NSN): 5180-00-293-2875  
Supply Catalog (SC) 5180-90-N08, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit contains nonpowered hand tools for completing basic carpentry tasks. It contains sufficient tools for four soldiers.

**NOTE:** This set has been upgraded and is available through GSA using NSN 5180-01-447-2200.

LEGACY

INTERIM

OBJECTIVE

---

## Sets, Kits, and Outfits – Kits

### Tool Kit, Electrician

---

**DESCRIPTION:**

Line item number (LIN): W36977  
National stock number (NSN): 5180-00-313-3045  
Supply Catalog (SC) 5180-90-N35, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides the necessary hand tools to allow the electrician to perform mission-essential-task-list (METL) tasks with regards to the theater of operations (TO) construction.

**NOTE:** This set has been upgraded and is available through GSA using NSN 5180-01-461-8150.

LEGACY

INTERIM

OBJECTIVE

---

### Tool Kit, Mason And Concrete Finisher

---

**DESCRIPTION:**

Line item number (LIN): W44923  
National stock number (NSN): 5180-00-596-1504  
Supply Catalog (SC) 5180-95-N14, dated 1 September 2000

**PROPONENT:** The United States (US) Army Logistics Support Agency.

**PURPOSE:** This kit provides the necessary tools for the carpentry and masonry specialist to lay brick and to block and form, place, and finish concrete vertical and flat work related to the theater of operations (TO) construction and airfield repair.

**NOTE:** This set has been upgraded and is available through General Services Administration (GSA) using NSN 5180-01-461-8110. The basis of issue (BOI) has been changed to one per platoon because it contains scaffolding, a cement mixer, and finishing tools in quantities not divisible at squad level. It contains enough individual hand tools for six block/brick layers.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Pioneer Engineer Combat Platoon

---

**DESCRIPTION:**

Line item number (LIN): W48074  
National stock number (NSN): 5180-00-596-1539  
Supply Catalog (SC) 5180-95-N10, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides the necessary components to support the engineer platoon. It will assist combat and construction engineers in the performance of land clearing, field engineering, rigging, climbing, and facilities erection and construction tasks.

**NOTE:** This kit has been upgraded and is available through GSA using NSN 5180-01-467-4677.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Pioneer Engineer Squad: Land Clearing and Building Erection

---

**DESCRIPTION:**

Line item number (LIN): W48348  
National stock number (NSN): 5180-00-596-1546  
Supply Catalog (SC) 5180-95-N12, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides the necessary components to support a combat-engineer squad and construction-engineer section in performing land clearing, building erection, and other field engineering and construction tasks.

**NOTE:** This set has been upgraded and is available through GSA using NSN 5180-01-467-4685.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Pioneer Platoon: General Labor

---

**DESCRIPTION:**

Line item number (LIN): W48211  
National stock number (NSN): 5180-00-596-1537  
Supply Catalog (SC) 5180-97-E11, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides hand tools and pioneering tools to support field-engineering work. It contains a multitude of tools and is intended for nonengineer units. This kit has been upgraded to provide the necessary equipment to support a platoon, a company, or a detachment in constructing field fortifications, fighting positions, shelters and other field work, lanes of fire, protective and defensive obstacles, and other simple pioneering tasks. It is available through GSA using, NSN 5180-01-467-4684.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Pipe Fitter, 1/8- to 2-Inch-Diameter Pipe

---

**DESCRIPTION:**

Line item number (LIN): W48622  
National stock number (NSN): 5180-00-596-1501  
Supply Catalog (SC) 5180-95-N13, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides the necessary equipment to support plumbing and pipeline installation and repair and well-drilling operations when working with pipe of 1/8- to 2-inch diameter.

**NOTE:** This kit has been upgraded and is available through GSA using NSN 5180-01-461-8108.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Pipe Fitter, Supplemental: 2 1/4- to 4-Inch-Diameter Pipe

---

**DESCRIPTION:**

Line item number (LIN): W48759  
National stock number (NSN): 5180-00-596-1509  
Supply Catalog (SC) 5180-95-N42, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides the necessary components to support plumbing and pipeline installation and repair and well-drilling operations.

**NOTE:** This kit has been upgraded and is available through GSA using NSN 5180-01-461-8107.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Pipeline Construction

---

**DESCRIPTION:**

Line item number (LIN): W58006  
National stock number (NSN): 5180-00-799-3342  
Supply Catalog (SC) 5180-98-E44, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Warren (TACOM-Warren).

**PURPOSE:** This kit provides the necessary tools to construct 4-, 6-, and 8-inch-diameter pipelines overland. It is used by pipeline construction units and pipeline and terminal operating units.

LEGACY

INTERIM

OBJECTIVE

---



## Tool Kit, Pipeline Construction, Grooved Coupling: Pipeline Maintenance

---

**DESCRIPTION:**

Line item number (LIN): W48896  
National stock number (NSN): 5180-00-640-5647  
Supply Catalog (SC) 5180-98-E56, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Warren (TACOM-Warren).

**PURPOSE:** This kit provides the necessary tools for the construction of 4-, 6-, and 8-inch-diameter grooved pipe. The kit is intended for use by pipeline construction workers and pipeline operating specialists. Electrical requirements for the operation of this kit are included in the set.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Plumber

---

**DESCRIPTION:**

Line item number (LIN): W49033  
National stock number (NSN): 5180-00-545-8647  
Supply Catalog (SC) 5180-95-N25, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides the necessary hand tools and devices to support the plumber in installing and repairing plumbing and pipe-laying construction tasks. It is also used to support well-drilling operations.

**NOTE:** This kit has been upgraded and is available through GSA using NSN 5180-01-467-4676.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Precision Instrument Repair

---

**DESCRIPTION:**

Line item number (LIN): W49307  
National stock number (NSN): 5180-00-596-1538  
Supply Catalog (SC) 5180-90-N53, dated 21 November 1985

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** General shop equipment provides the necessary components to this tool kit. This kit is intended to be used by repairmen. Electrical requirements for the operation of this kit are included in the description column of the respective electrical component(s), as applicable.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Rigging, Wire Rope: Cutting, Clamping, and Splicing, With Chest

---

**DESCRIPTION:**

Line item number (LIN): W50266  
National stock number (NSN): 5180-00-596-1513  
Supply Catalog (SC) 5180-95-E15, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Warren (TACOM-Warren).

**PURPOSE:** This kit provides the necessary components for splicing, repairing, and rigging 3/8-, 1/2-, and 5/8-inch-diameter wire rope.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Kit, Supplemental Pipeline Construction, Welder's Miscellaneous Hand Tools and Equipment

---

**DESCRIPTION:**

Line item number (LIN): W56910  
National stock number (NSN): 5180-00-799-3339  
Supply Catalog (SC) 5180-95-N15, dated 1 September 2000

**PROPONENT:** The General Services Administration (GSA).

**PURPOSE:** This kit provides tools, devices, and equipment to supplement the welding and pipeline construction work necessary in laying overland pipelines. The kit is intended for use by pipeline workers.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Set, Pioneer Squad: Light

---

**DESCRIPTION:**

Line item number (LIN): W59240  
National stock number (NSN): 5180-00-900-8559  
Supply Catalog (SC) 5180-95-B21, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** This set provides the necessary components to support light, airborne, and air-assault combat engineer squads in the performance of field engineering, pioneering, demolition, and assault tasks.

**NOTE:** This set has been upgraded and is available through the General Services Administration (GSA) using NSN 5180-01-4679 (for units not mounted in M113) and NSN 5180-01-467-4691 (for units mounted in M113). The basis of issue (BOI) includes all combat-engineer squads and armored cavalry and scouts.

LEGACY

INTERIM

OBJECTIVE

---

**SECTION III**

**SETS, KITS, AND OUTFITS**

**Part 3. Outfits**

## Rock-Drilling Equipment: For Placement Of Explosives

---

**DESCRIPTION:**

Line item number (LIN): S03225  
National stock number (NSN): 3820-00-430-3094  
Supply Catalog (SC) 3820-98-E10, dated 1 October 1978

**PROPONENT:** United States (US) Army Tank-Automotive and Armaments Command (TACOM).

**PURPOSE:** This outfit supports rock-quarry and civil-construction operations. It contains rock-drilling equipment and accessories for drilling holes in rocky ground of sufficient size, depth, and number so that blasting will produce enough rock to maintain full operation of a 75-ton-per-hour (TPH) rock-crushing plant.

LEGACY

INTERIM

OBJECTIVE

---

## Shop Equipment, Contact Maintenance, Truck-Mounted

---

**DESCRIPTION:**

Line item number (LIN): S30914  
National stock number (NSN): 4940-01-209-8824  
Supply Catalog (SC) 4940-95-B21, dated 1 June 1994

LIN: T10138  
NSN: 4940-00-294-9518  
SC 4940-95-B04, dated 1 September 2000

LIN: S25681  
NSN: 4940-01-209-8824  
SC 4940-95-B21, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** This set provides tools and equipment necessary to maintain both wheeled and engineer vehicles at a field location. The contact maintenance truck (CMT) can be attached to a number of different vehicle chassis, creating a set with a different LIN and NSN. Available chassis include the M880-series; the commercial utility cargo vehicle (CUCV); and the high-mobility, multipurpose, wheeled vehicle (HMMWV). The S25681 CMT is the “set” portion carried on a heavy variant of the HMMWV.

LEGACY

INTERIM

OBJECTIVE

---

## Shop Equipment, General-Purpose Repair, Semitrailer-Mounted

---

**DESCRIPTION:**

Line item number (LIN): T10549  
National stock number (NSN): 4940-00-287-4894  
Supply Catalog (SC) 4940-95-B02, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** This set, kit, and outfit (SKO) provides the necessary components and workspace for general-purpose repairs normally associated with machining, welding, and metal-shop work. The SKO is intended for use by general-support and direct-support maintenance teams. This set is more commonly called the trailer-mounted Batmobile.

LEGACY

INTERIM

OBJECTIVE

---

## Shop Equipment, Organizational Repair, Light, Truck-Mounted

---

**DESCRIPTION:**

Line item number: T13152  
National stock number (NSN): 4940-00-284-9516  
Supply Catalog (SC) 4940-95-B03, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** This set, kit, and outfit (SKO) provides the necessary components to the truck-mounted organizational repair-shop set. This SKO is intended for use by a machinist in support of mechanics performing organizational and direct-support maintenance. This set is commonly referred to as the Batmobile.

LEGACY

INTERIM

OBJECTIVE

---

## Shop Equipment, Woodworking: Base Maintenance, Trailer-Mounted

---

### DESCRIPTION:

Line item number (LIN): T16988  
National stock number (NSN): 3220-00-270-8630  
Supply Catalog (SC) 3220-97-E01, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** This set, kit, and outfit (SKO) provides a mobile woodworking set for use in theater of operations (TO) construction. It contains numerous saws and drills as well as assorted blades, drill bits, and accessories. A 10-kilowatt generator is necessary to power the tools. A revised suite of tools has been developed for this SKO and is available through the General Services Administration (GSA) under NSN 5180-01-441-2123. The set is under revision.

LEGACY

INTERIM

OBJECTIVE

---

## Tool Outfit, Hydraulic-System Test and Repair Unit (HSTRU)

---

### DESCRIPTION:

Line item number (LIN): T30377  
National stock number (NSN): 4940-01-036-5784  
Supply Catalog (SC) 4940-95-B07, dated 1 September 2000

**PROPONENT:** The United States (US) Army Tank-Automotive and Armaments Command—Rock Island Arsenal (TACOM-RIA).

**PURPOSE:** The unit tests and repairs hydraulic systems in the field. It operates on 120-volt, 60-hertz power and can fabricate hose and tube assemblies, measure pressure, flush and clean hydraulic systems, and transfer fluid.

LEGACY

INTERIM

OBJECTIVE

---

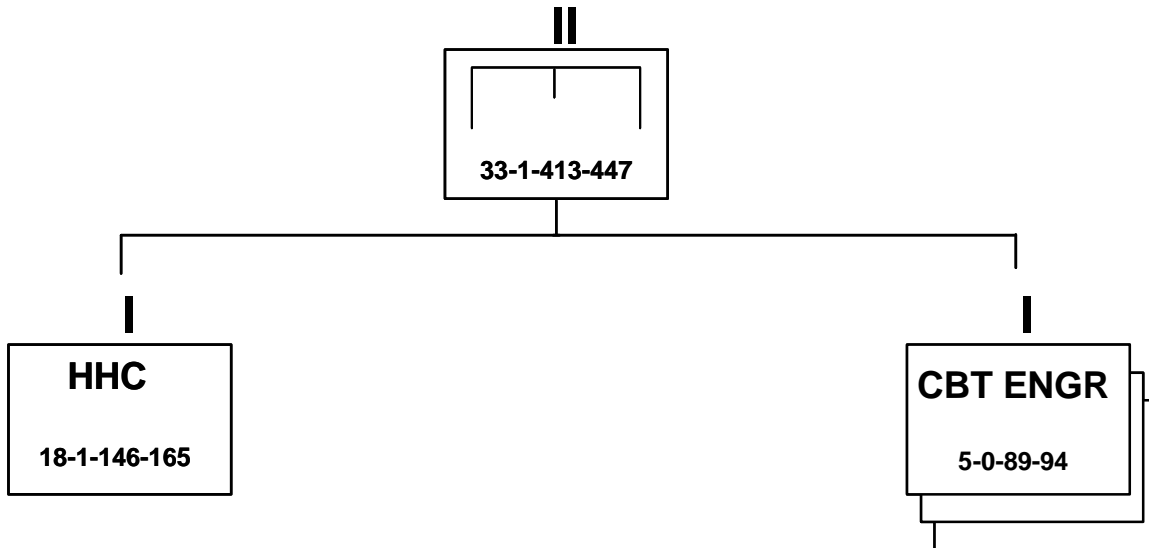


**APPENDIX A**  
**UNIT REFERENCE SHEETS**

**NOTE: Engineer organizations for the Interim Division are not included because they have not been approved by Department of the Army (DA).**

# ENGINEER BATTALION, AIRBORNE DIVISION

TOE 05025A000

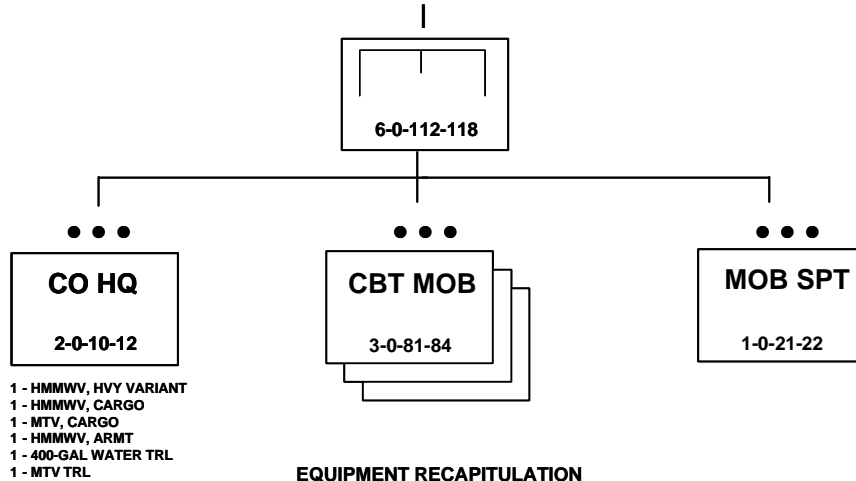


## EQUIPMENT RECAPITULATION

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| 12 - SEE                         | 1 - FORKLIFT R/T                     |
| 1 - STEAM CLEANER, TRL MTD       | 6 - TRUCK, TRACTOR, MTV              |
| 2 - ROAD GRADER                  | 63 - HMMWV, CARGO                    |
| 3 - MINE DISPENSER (FLIPPER)     | 8 - TRUCK, DUMP, MTV                 |
| 6 - MINE DISPENSER (HTLD)        | 6 - DEUCE                            |
| 3 - SCOOP LOADER                 | 1 - TRUCK, WRECKER, MTV              |
| 1 - LUB-SERV UNIT, TRL MTD       | 34 - 3/4-TON TRL                     |
| 6 - 25-TON SEMITRAILER (LOW BED) | 3 - TANK UNIT (LIQUID DISP), TRL MTD |
| 1 - HMMWV, HVY VARIANT           | 1 - WELDING TRL                      |
| 27 - EXCAVATOR AND FRONT LOADER  | 5 - 400-GAL WATER TRL                |
| 1 - HYSTRU                       | 3 - 5-TON DUMP TRUCK                 |
| 10 - LMTV, CARGO                 | 4 - LMTV TRL                         |
|                                  | 3 - MTV TRL                          |

# ENGINEER COMPANY, INTERIM BRIGADE COMBAT TEAM

TOE 05063F300

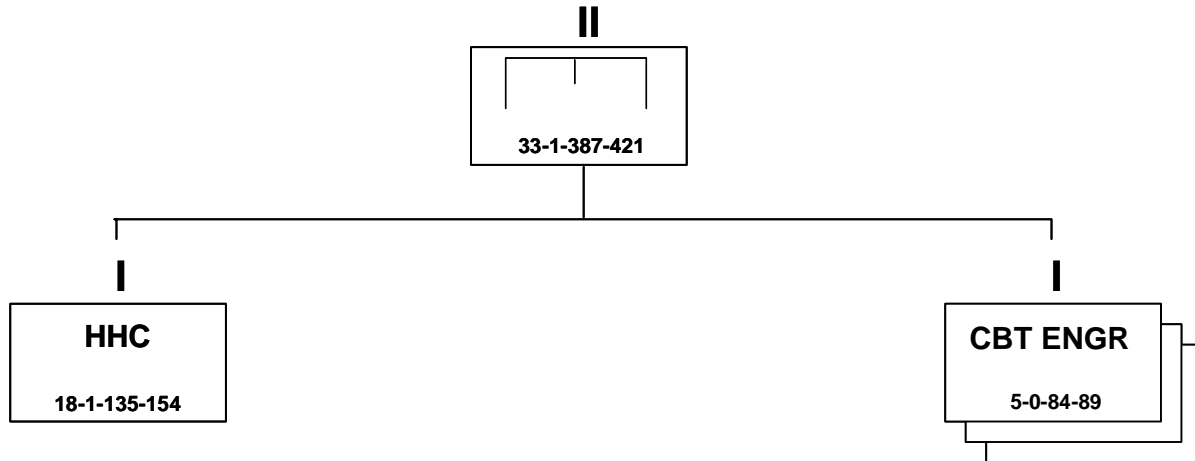


## EQUIPMENT RECAPITULATION

- |                           |                         |
|---------------------------|-------------------------|
| 3 - MINE DISPENSER (HTLD) | 4 - TRUCK, CBT          |
| 9 - 2 1/2-TON TRL         | 2 - HMMWV, ARMT         |
| 6 - MICLIC                | 6 - HMMWV, EXPANDED CAP |
| 1 - HMMWV, HVY VARIANT    | 4 - 8x20 TRL            |
| 6 - EXCAVATOR AND LOADER  | 7 - 3/4-TON TRL         |
| 1 - HMMWV, CARGO          | 1 - 400-GAL WATER TRL   |
| 1 - MTV, CARGO            | 1 - MTV TRL             |
| 9 - MTV, DUMP             |                         |
| 6 - DEUCE                 |                         |

# ENGINEER BATTALION, LIGHT INFANTRY DIVISION

TOE 05155A000

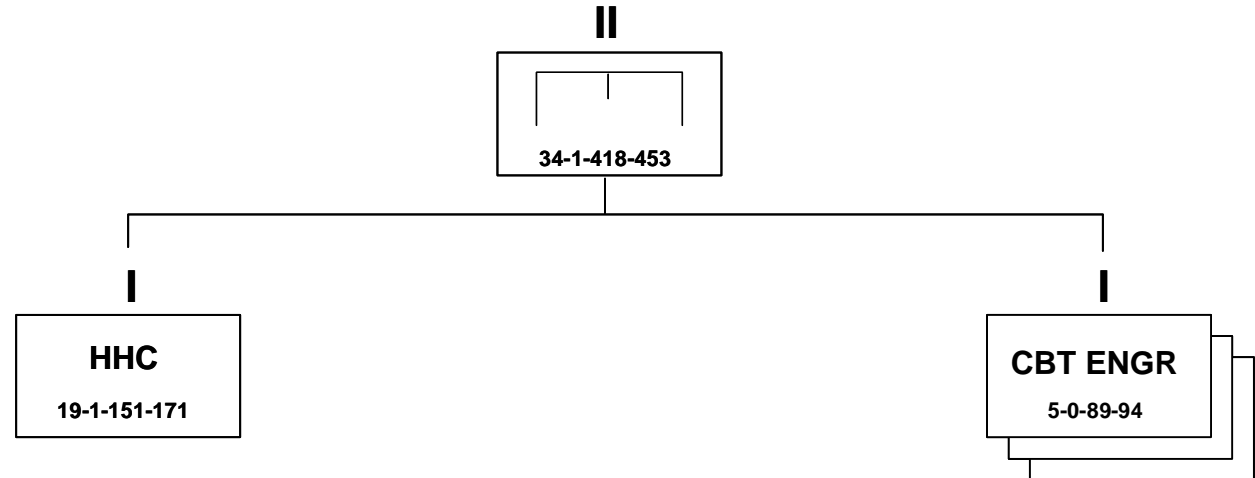


## EQUIPMENT RECAPITULATION

1 - STEAM CLEANER, TRL MTD	3 - MTV, CARGO
9 - MINE DISPENSER (FLIPPER)	3 - MTV, DUMP
3 - MINE DISPENSER (HTLD)	6 - DEUCE
4 - MKT	6 - LET, TRK TRACTOR
6 - 40-TON SEMITRAILER	1 - MTV, WRECKER
1 - HMMWV, HVY VARIANT	49 - 3/4-TON TRL
1 - HYSTRU	5 - 400-GAL WATER TRL
18 - SEE	2 - LMTV TRL
7 - LMTV, CARGO	3 - MTV TRL
61 - HMMWV, CARGO	

# ENGINEER BATTALION, AIR-ASSAULT DIVISION

TOE 05215A000



## EQUIPMENT RECAPITULATION

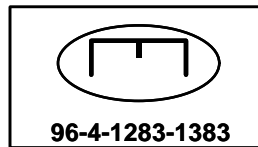
- |                              |                       |
|------------------------------|-----------------------|
| 1 - STEAM CLEANER, TRL MTD   | 12 - MTV, TRACTOR     |
| 3 - MINE DISPENSER (FLIPPER) | 65 - HMMWV, CARGO     |
| 6 - MINE DISPENSER (HTLD)    | 9 - MTV, DUMP         |
| 2 - MKT                      | 2 - MTV, WRECKER      |
| 1 - SCOOP LOADER             | 46 - 3/4-TON TRL      |
| 12 - 25-TON SEMITRAILER      | 1 - WELDING TRL       |
| 1 - HMMWV, HVY VARIANT       | 12 - BULDOZER, LIGHT  |
| 1 - HYSTRU                   | 2 - 400-GAL WATER TRL |
| 27 - SEE                     | 1 - LMTV TRL          |
| 7 - LMTV, CARGO              | 3 - MTV TRL           |

## Appendix A

# ENGINEER BRIGADE, HEAVY DIVISION

TOE 05330L000

X



**HHD**

15-1-41-57

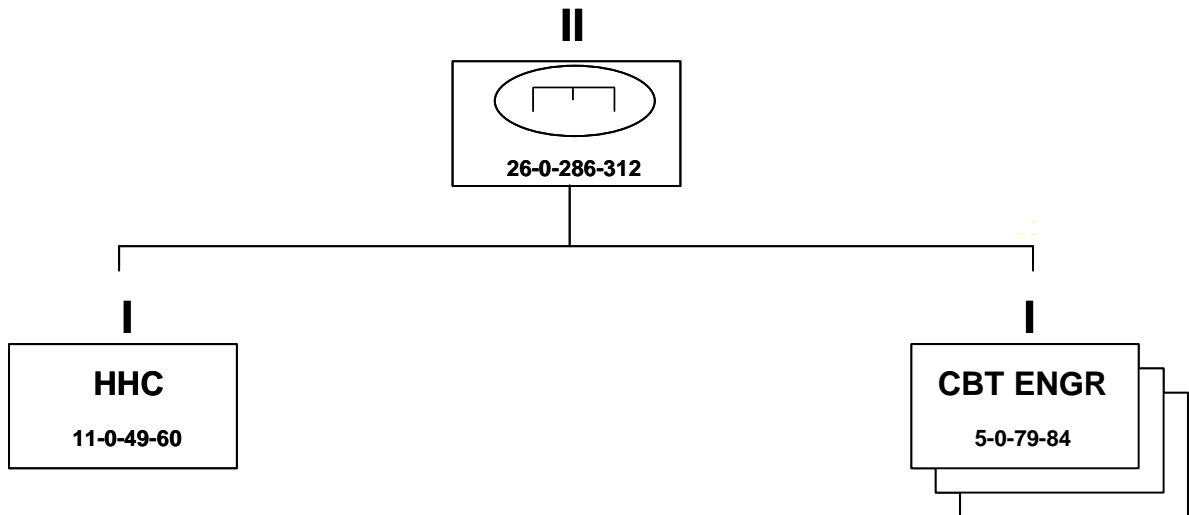
**CBT ENGR**

27-1-414-442

### EQUIPMENT RECAPITULATION

21 - M577	18 - SEE
9 - STEAM CLEANER, TRL MTD	18 - HEMTT CARGO W/M CRANE
18 - M548	6 - HEMTT CARGO W/L CRANE
18 - MINE DISPENSER (HTLD)	29 - LMTV, CARGO
36 - 2 1/2-TON TRL	102 - HMMWV, CARGO
87 - M2A3 BRADLEY	9 - MTV, CARGO
36 - WOLVERINE	3 - HEMTT, WRECKER
6 - MKT	12 - HEMTT, FUELER
36 - MICLIC	9 - 3/4-TON TRL
3 - LUBR-SERV UNIT, TRL MTD	63 - M9 ACE
6 - M88A2 RECOVERY VEH	54 - 1 1/2-TON TRL
9 - HMMWV, HVY VARIANT	12 - 400-GAL WATER TRL
3 - HSTRU	3 - WELDING TRL
19 - LMTV TRL	

# ENGINEER BATTALION, HEAVY DIVISION (WITH GRIZZLY AND WOLVERINE) TOE 05335F000

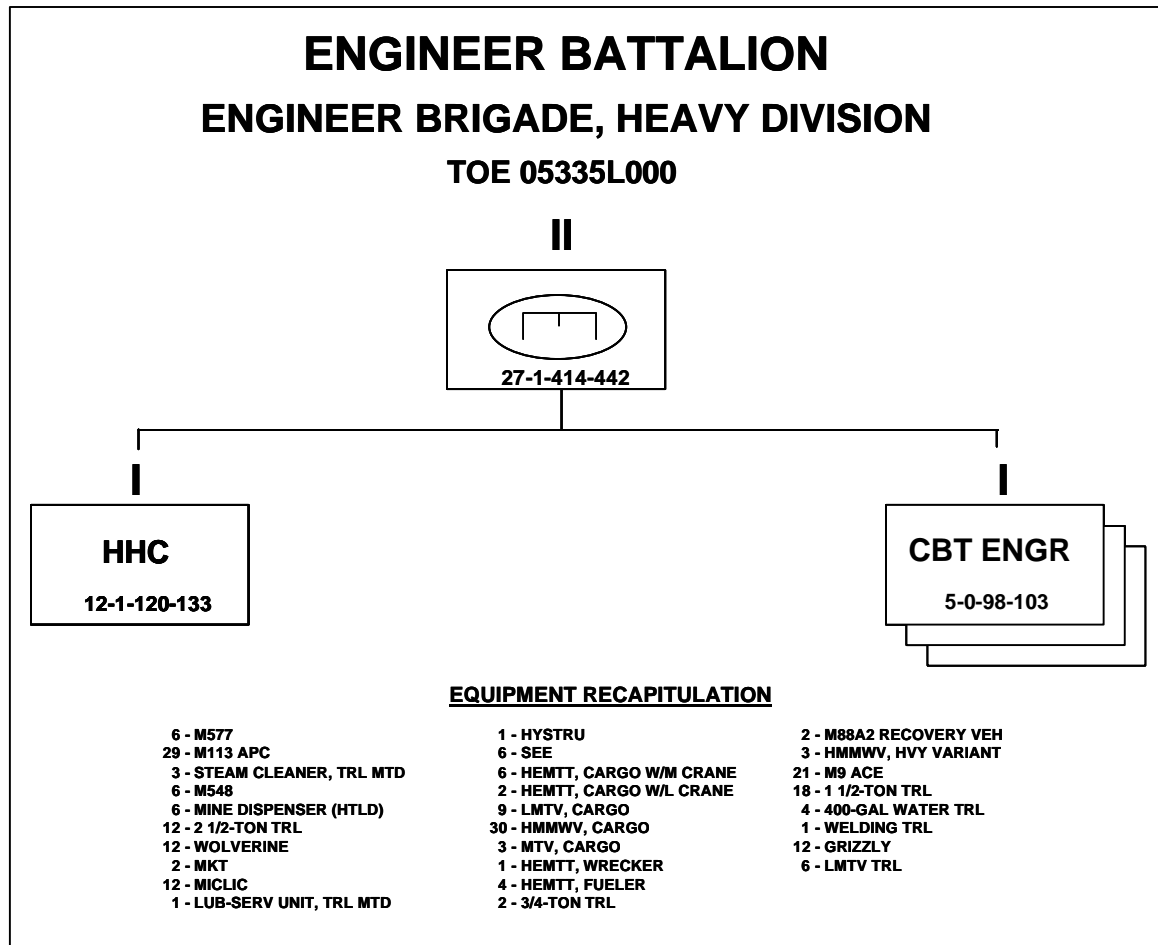


## EQUIPMENT RECAPITULATION

6 - M577	3 - MTV, CARGO
34 - M113 APC	2 - 3/4-TON TRL
6 - M548	12 - M9 ACE
6 - MINE DISPENSER (HTLD)	12 - 1 1/2-TON TRL
12 - 2 1/2-TON TRL	4 - 400-GAL WATER TRL
12 - WOLVERINE	12 - GRIZZLY
12 - MICLIC	4 - LMTV TRL
6 - HEMTT, CARGO W/M CRANE	
6 - LMTV, CARGO	
27 - HMMWV, CARGO	

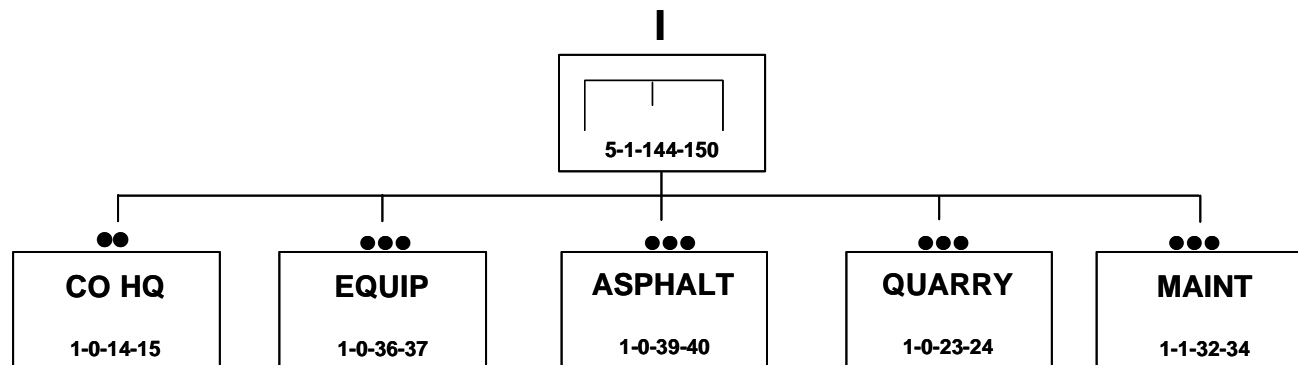


## Appendix A



# ENGINEER CONSTRUCTION-SUPPORT COMPANY

TOE 05413L000



1 - MKT  
2 - LMTV, CARGO  
1 - HMMWV, CARGO  
1 - 400-GAL WATER TRL  
1 - LMTV TRL

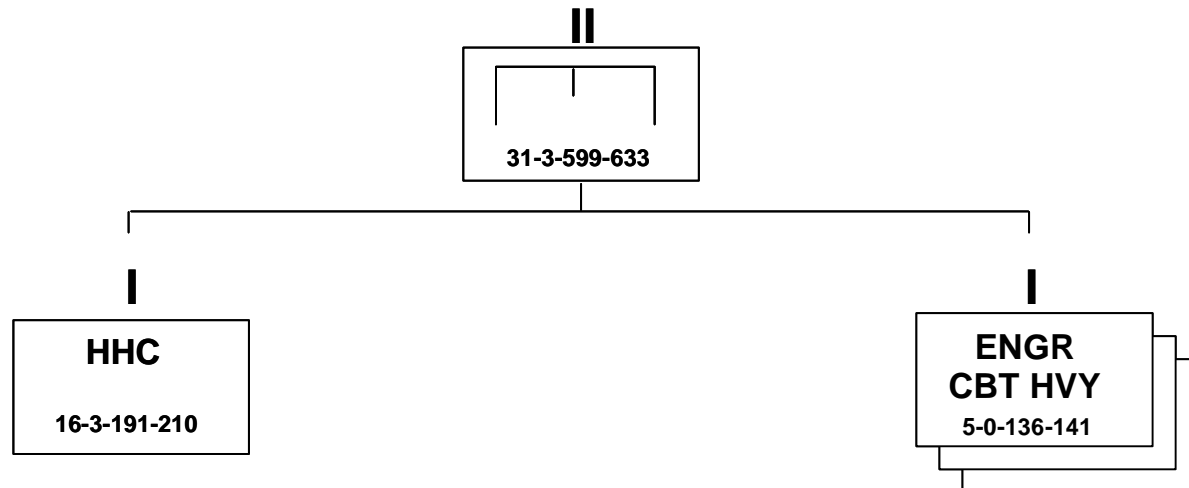
## EQUIPMENT RECAPITULATION

2 - STEAM CLEANER, TRL MTD  
1 - 25-TON CRANE  
4 - 14-TON DUMP BODY  
1 - 6,000-GAL WATER TANK  
1 - MKT  
6 - SCOOP LOADER  
2 - LUB-SERV UNIT, TRL MTD  
1 - DISTR-LIQ BITUMIN  
2 - 40-TON CRANE  
1 - CRUSH, SCREEN, AND WASH PLANT  
4 - FLOODLIGHT SET, TRL MTD  
2 - MELTER, ASPHALT  
1 - MIXING PLANT, ASPHALT  
2 - PAVING MACHINE, BITUMIN  
4 - ROLLER, MOTORIZED, STEEL WHEEL  
2 - 2,500-GAL SPREADER  
1 - 5,000-GAL SEMITRAILER TANK  
3 - SEMITRAILER VAN  
4 - HMMWV, HVY VARIANT  
1 - HYSTRU

2 - TRUCK CARGO, HVY PLS  
6 - LMTV, CARGO  
2 - MTV, TRACTOR  
5 - HMMWV, CARGO  
1 - MTV, CARGO  
1 - HEMTT, WRECKER  
1 - FORKLIFT R/T  
5 - LET, TRACTOR  
2 - 8x20 TRAILER  
2 - SWEEPER, ROTARY, TOWED  
2 - WELDING TRL  
2 - BULLDOZER  
1 - 400-GAL WATER TRL  
6 - 20-TON DUMP TRUCK  
4 - LMTV TRL  
6 - SEMITRAILER, LOW BED (HDMET)  
1 - MTV TRL  
1 - MTV, FUELER  
4 - TRUCK, TRACTOR (HDMET)  
1 - EXCAVATOR (HYEX)

# ENGINEER BATTALION COMBAT HEAVY

TOE 05415L000

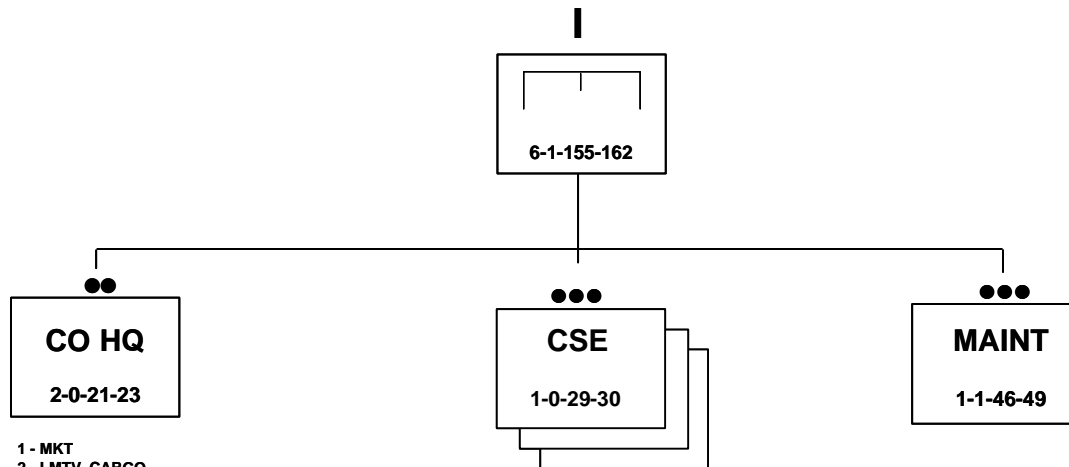


## EQUIPMENT RECAPITULATION

4 - STEAM CLEANER, TRL MTD	12 - SCRAPER, EARTH MOVING	30 - MTV, DUMP
3 - 25-TON CRANE	1 - 22 1/2-TON SEMITRAILER, FLAT BED	3 - FORKLIFT R/T
6 - 6,000-GAL WATER TANK	22 - 40-TON SEMITRAILER, LOW BED	9 - HEMTT, FUELER
3 - COMPACTOR, HIGH SPEED	2 - SEMITRAILER VAN	28 - LET, TRACTOR
12 - FLOODLIGHT SET, TRL MTD	7 - HMMWV, HVY VARIANT	6 - 8x20 TRAILER
9 - GRADER	1 - HYSTRU	1 - MTV, WRECKER
3 - MKT	6 - SEE	6 - 3/4-TON TRL
8 - SCOOP LOADER	1 - HMMWV, AMBULANCE	1 - SWEEPER, ROTARY, TOWED
5 - LUB-SERV UNIT, TRL MTD	6 - TRUCK CARGO, HVY PLS	5 - WELDING TRL
2 - MELTER, ASPHALT	1 - 4,000-LB FORKLIFT	21 - BULLDOZER
1 - MIXER, ROTARY TILLER	29 - LMTV, CARGO	6 - 400-GAL WATER TRL
3 - 2,600-GAL MIXER	4 - MTV, TRACTOR	9 - 20-TON DUMP TRUCK
1 - ROLLER, MOTORIZED, STEEL WHL	35 - HMMWV, CARGO	12 - VIBRATOR, CONCRETE, PNEU
5 - ROLLER, VIBRATORY	5 - MTV, CARGO	40 - LMTV TRL
3 - 2,500-GAL SPREADER	4 - HEMTT, WRECKER	3 - EXCAVATOR (HYEX)

# ENGINEER COMBAT-SUPPORT-EQUIPMENT COMPANY

TOE 05423L000



1 - MKT  
2 - LMTV, CARGO  
2 - HMMWV, CARGO  
1 - 400-GAL WATER TRL  
1 - LMTV TRL

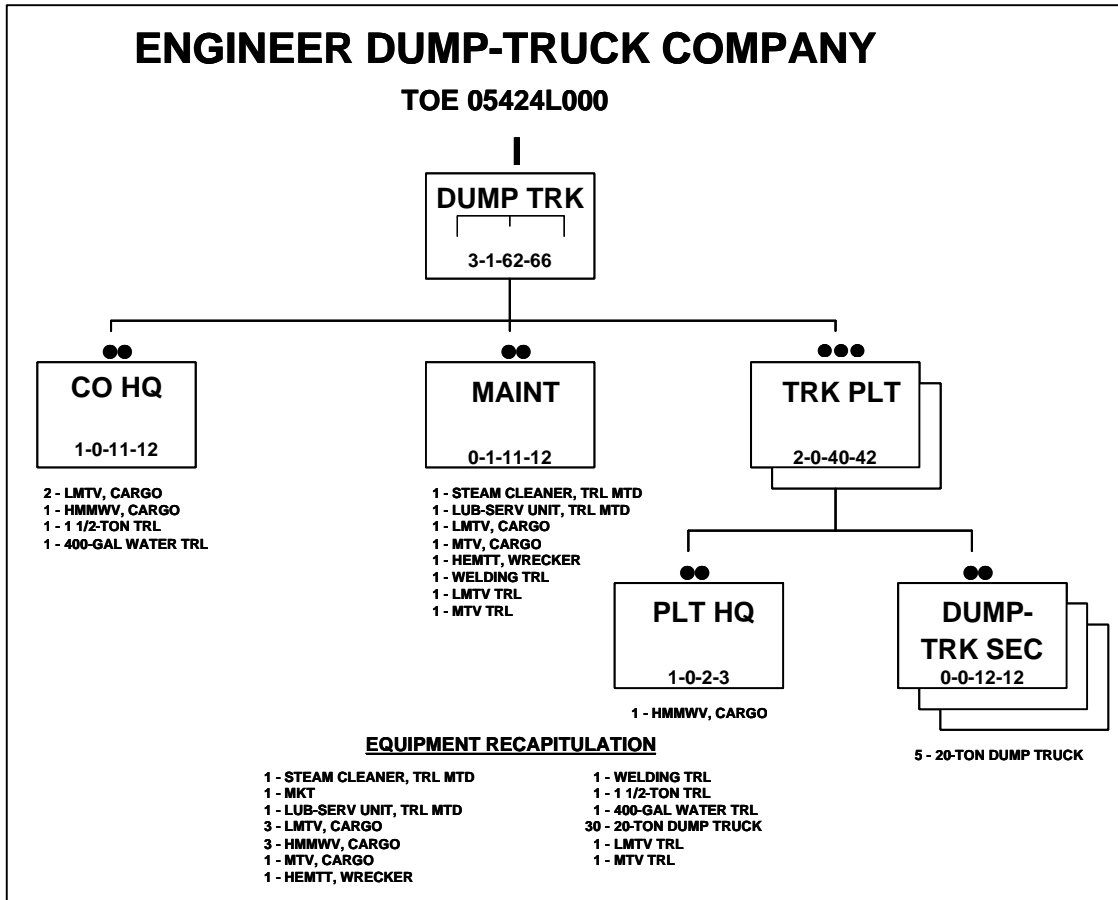
## EQUIPMENT RECAPITULATION

2 - STEAM CLEANER, TRL MTD  
3 - 25-TON CRANE  
3 - 2,500-GAL WATER DISTR  
3 - COMPACTOR, HIGH SPEED  
3 - FLOODLIGHT SET, TRL MTD  
6 - ROAD GRADER  
1 - MKT  
3 - SCOOP LOADER  
1 - LUB-SERV UNIT, TRL MTD  
6 - ROLLER, VIBRATORY  
6 - SCRAPER  
6 - 40-TON SEMITRAILER, LOW BED

3 - SEMITRAILER VAN  
4 - HMMWV, HVY VARIANT  
1 - HEMTT, WRECKER  
9 - MTV, DUMP  
1 - FORKLIFT R/T  
3 - HEMTT, FUELER  
1 - MTV, WRECKER  
1 - WELDING TRL  
1 - HYSTRU  
6 - SEE  
6 - LMTV, CARGO  
6 - MET, TRACTOR

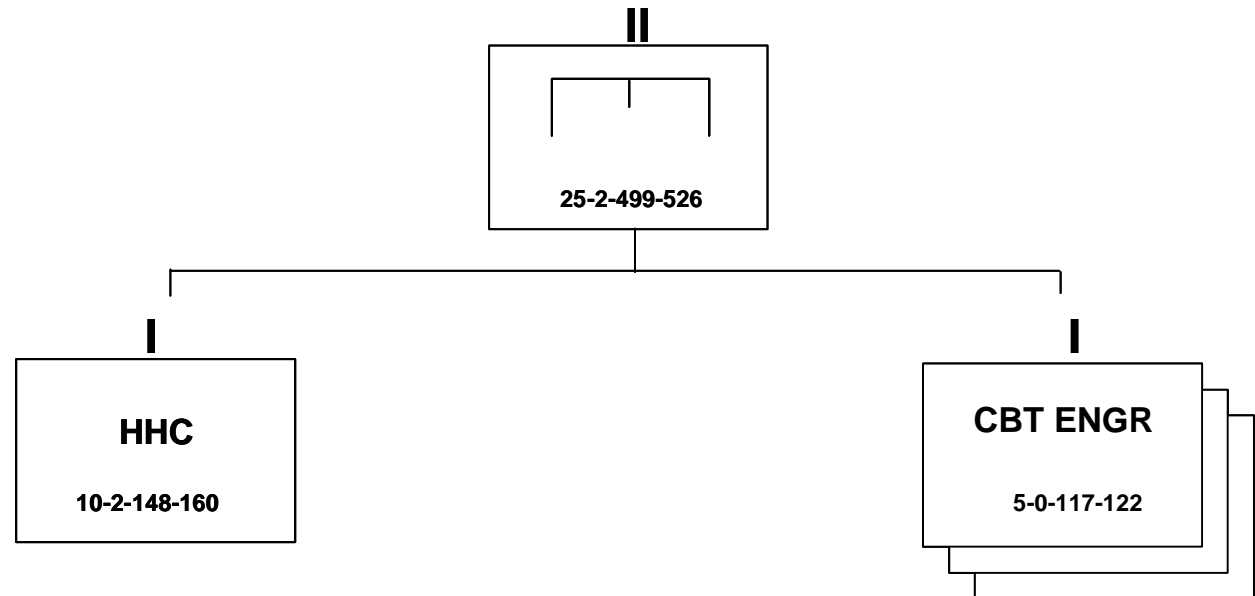
4 - MTV, TRACTOR  
12 - HMMWV, CARGO  
6 - BULLDOZER  
1 - 400-GAL WATER TRL  
12 - 20-TON DUMP TRUCK  
3 - LMTV TRL

## Appendix A



# ENGINEER BATTALION, CORPS (WHEELED)

TOE 05425L000



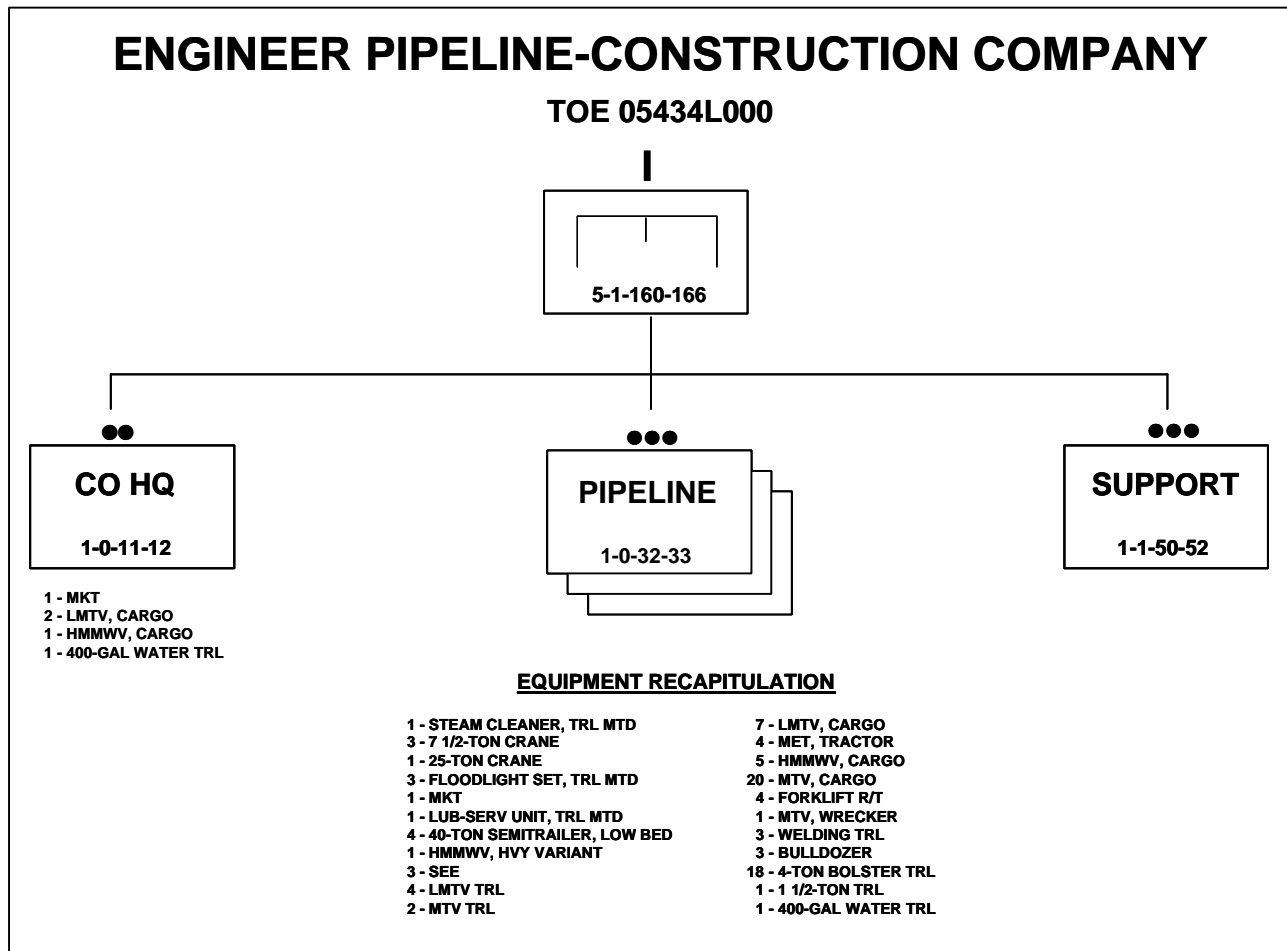
## EQUIPMENT RECAPITULATION

1 - STEAM CLEANER, TRL MTD  
 3 - 25-TON CRANE  
 3 - 2,500-GAL WATER DISTR  
 6 - MINE DISPENSER (HTLD)  
 12 - 2 1/2-TON TRL  
 9 - ROAD GRADER  
 2 - MKT  
 12 - MICLIC  
 6 - SCOOP LOADER  
 1 - LUB-SERV UNIT, TRL MTD  
 6 - ROLLER, TOWED, VIBRATORY  
 12 - 40-TON SEMITRAILER, LOW BED

5 - HMMWV, HVY VARIANT  
 1 - HYSTRU  
 18 - SEE  
 13 - HEMTT, CARGO W/M CRANE  
 17 - LMTV, CARGO  
 12 - MET, TRACTOR  
 38 - HMMWV, CARGO  
 4 - HEMTT, WRECKER  
 54 - MTV, DUMP  
 1 - FORKLIFT R/T  
 3 - HEMTT, FUELER  
 3 - 3/4-TON TRL

4 - WELDING TRL  
 12 - BULLDOZER  
 36 - 4-TON BOLSTER TRL  
 3 - 400-GAL WATER TRL  
 9 - LMTV TRL

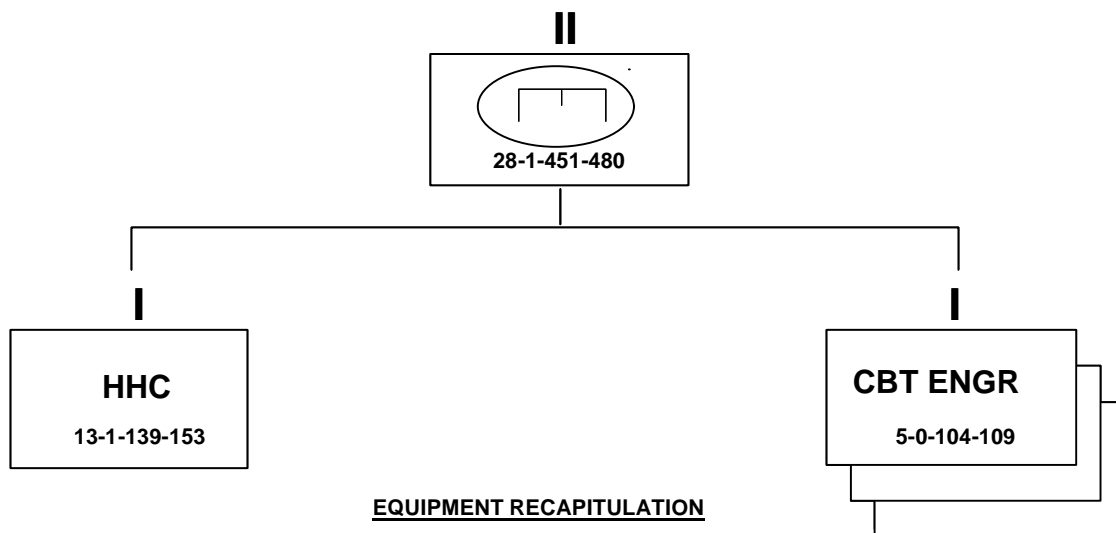
## Appendix A





# ENGINEER BATTALION CORPS (MECHANIZED)

TOE 05435L200

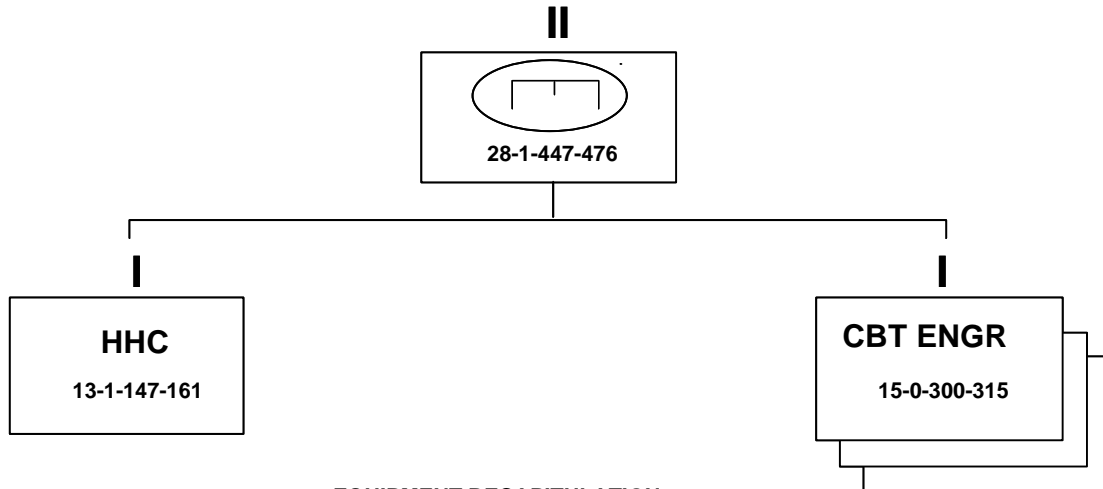


2 - M577  
 28 - M113 APC  
 1 - STEAM CLEANER, TRL MTD  
 6 - M548  
 6 - MINE DISPENSER (HTLD)  
 2 - MKT  
 1 - LUB-SERV UNIT, TRL MTD  
 3 - M88A2, RECOVERY VEH  
 3 - HMMWV, HVY VARIANT  
 1 - HYSTRU  
 6 - SEE  
 6 - HEMTT, CARGO W/M CRANE  
 3 - 11-TON TRL, FLATBED  
 7 - HEMTT, CARGO W/L CRANE  
 21 - LMTV, CARGO

33 - HMMWV, CARGO  
 3 - HEMTT, WRECKER  
 18 - MTV, DUMP  
 1 - FORKLIFT R/T  
 3 - HEMTT, FUELER  
 3 - 3/4-TON TRL  
 1 - WELDING TRL  
 18 - M9 ACE  
 12 - 4-TON BOLSTER TRL  
 18 - 1 1/2-TON TRL  
 3 - 400-GAL WATER TRL  
 20 - LMTV TRL

# ENGINEER BATTALION CORPS (MECHANIZED)

TOE 05435L300

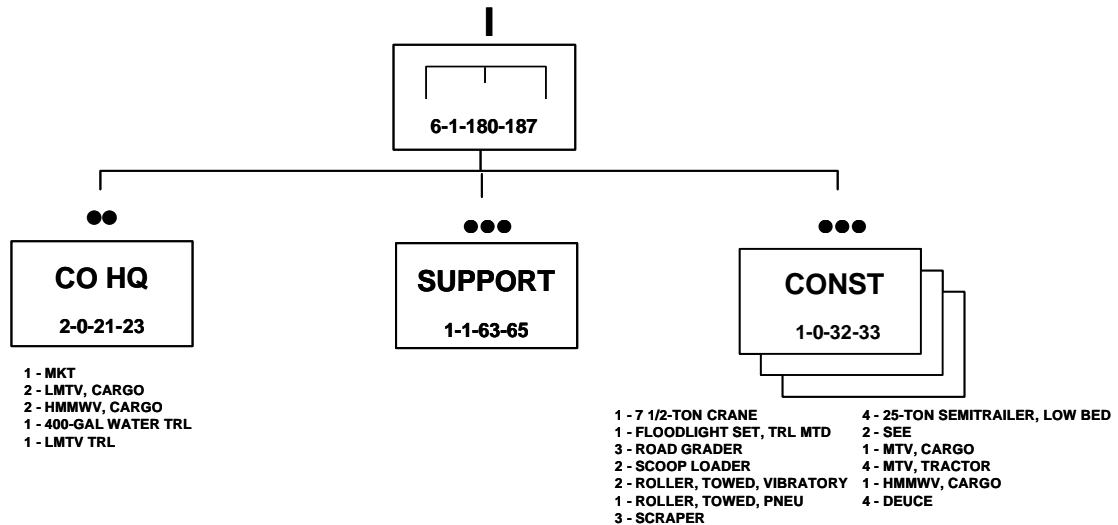


## EQUIPMENT RECAPITULATION

2 - M577	6 - HEMTT, CARGO W/M CRANE
28 - M113 APC	7 - HEMTT, CARGO W/L CRANE
1 - STEAM CLEANER, TRL MTD	21 - LMTV, CARGO
6 - M548	33 - HMMWV, CARGO
6 - MINE DISPENSER (HTLD)	3 - HEMTT, WRECKER
12 - WOLVERINE	12 - MTV, DUMP
2 - MKT	1 - FORKLIFT R/T
1 - LUB-SERV UNIT, TRL MTD	4 - HEMTT, FUELER
3 - M88A2, RECOVERY VEH	3 - 3/4-TON TRL
3 - HMMWV, HVY VARIANT	1 - WELDING TRL
1 - HYSTRU	18 - M9 ACE
6 - SEE	6 - 4-TON BOLSTER TRL
3 - 400-GAL WATER TRL	18 - 1 1/2-TON TRL
12 - GRIZZLY	20 - LMTV TRL

# ENGINEER COMPANY, LIGHT EQUIPMENT (AIRBORNE)

TOE 05443L100

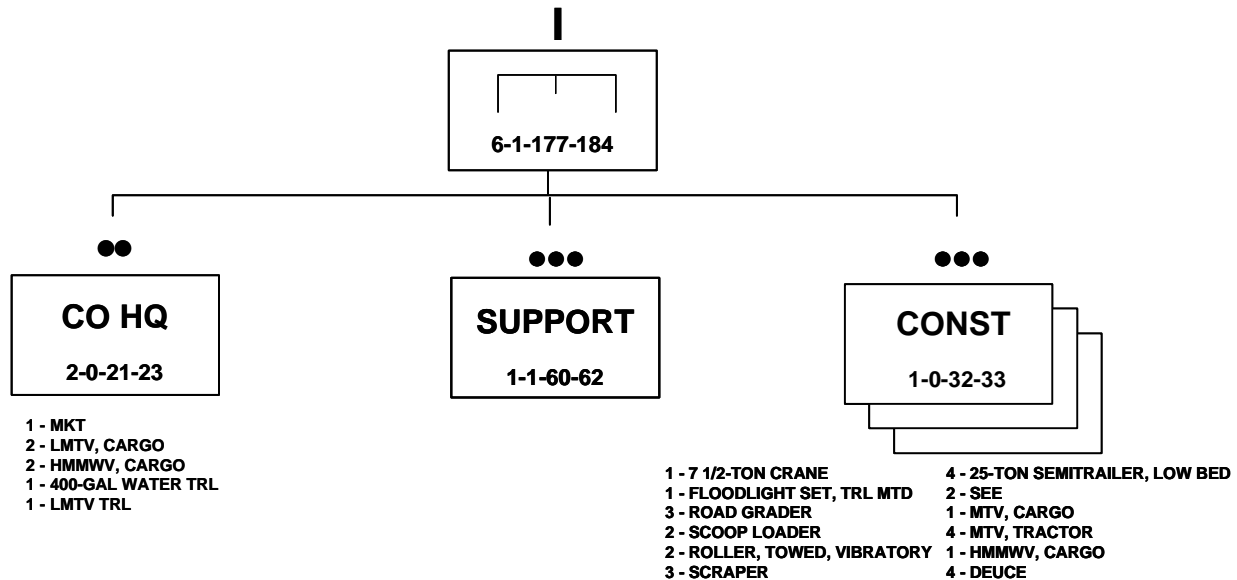


## EQUIPMENT RECAPITULATION

1 - STEAM CLEANER, TRL MTD	6 - MTV, CARGO
3 - FLOODLIGHT SET, TRL MTD	3 - LMTV, CARGO
9 - ROAD GRADER	1 - FORKLIFT R/T
1 - MKT	12 - MTV, TRACTOR
6 - SCOOP LOADER	6 - HMMWV, CARGO
1 - LUB-SERV UNIT, TRL MTD	18 - MTV, DUMP
6 - ROLLER, TOWED, VIBRATORY	12 - DEUCE
3 - ROLLER, TOWED, PNEU	1 - MTV, WRECKER
9 - SCRAPER	1 - WELDING TRL
12 - 25-TON SEMITRAILER, LOW BED	1 - 400-GAL WATER TRL
3 - HMMWV, HVY VARIANT	2 - LMTV TRL
6 - SEE	1 - MTV TRL

# ENGINEER COMPANY, LIGHT EQUIPMENT

TOE 05443L200

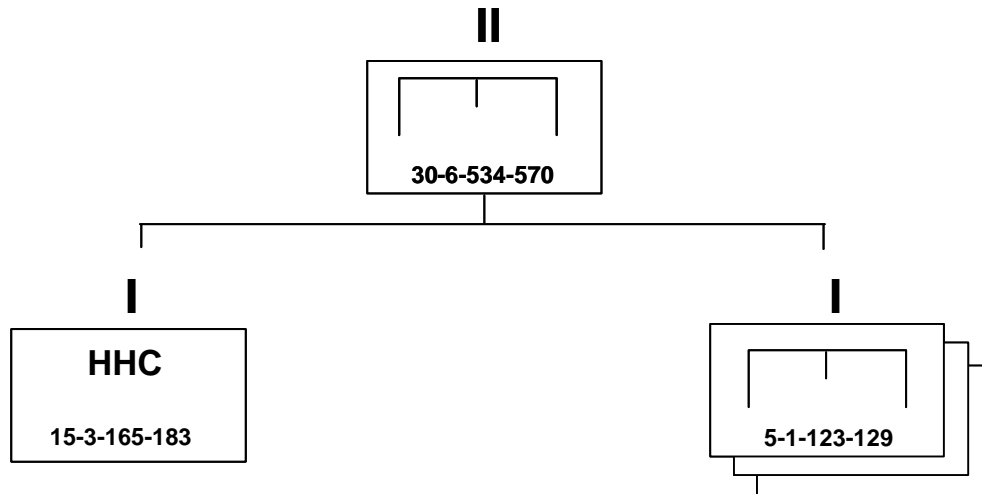


## EQUIPMENT RECAPITULATION

- |                                  |                       |
|----------------------------------|-----------------------|
| 1 - STEAM CLEANER, TRL MTD       | 6 - SEE               |
| 3 - 7 1/2-TON CRANE              | 6 - MTV, CARGO        |
| 3 - 2,500-GAL WATER DISTR        | 1 - FORKLIFT R/T      |
| 3 - FLOODLIGHT SET, TRL MTD      | 3 - LMTV, CARGO       |
| 9 - ROAD GRADER                  | 12 - MTV, TRACTOR     |
| 1 - MKT                          | 6 - HMMWV, CARGO      |
| 6 - SCOOP LOADER                 | 18 - MTV, DUMP        |
| 1 - LUB-SERV UNIT, TRL MTD       | 12 - DEUCE            |
| 6 - ROLLER, TOWED, VIBRATORY     | 1 - MTV, WRECKER      |
| 9 - SCRAPER                      | 1 - WELDING TRL       |
| 12 - 25-TON SEMITRAILER, LOW BED | 1 - 400-GAL WATER TRL |
| 3 - HMMWV, HVY VARIANT           | 2 - LMTV TRL          |
| 3 - MTV, FUELER                  | 1 - MTV TRL           |

# ENGINEER BATTALION, CORPS (AIRBORNE)

TOE 05445L100

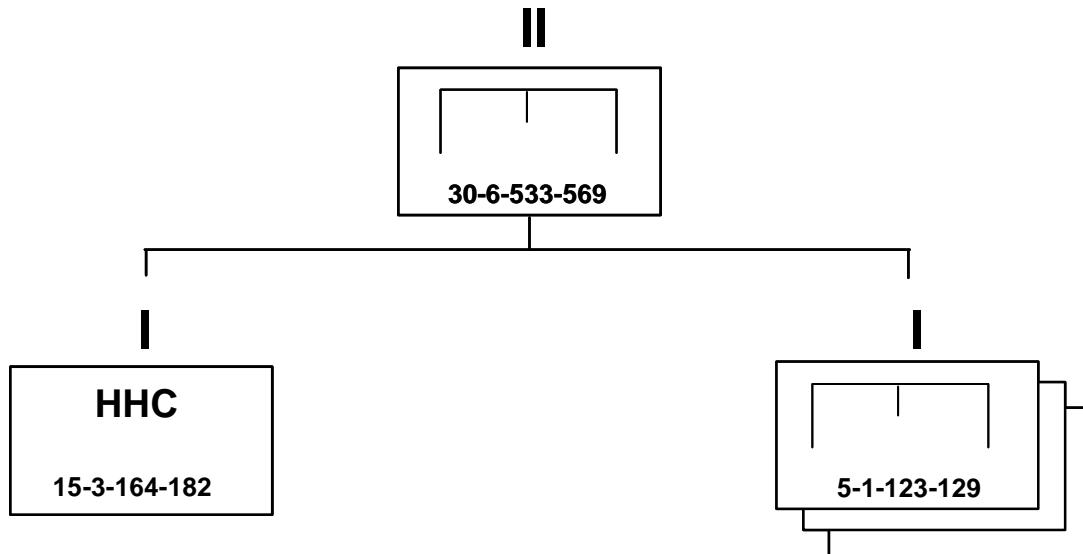


## EQUIPMENT RECAPITULATION

4 - STEAM CLEANER, TRL MTD	1 - HMMWV, AMBULANCE
3 - 7 1/2-TON CRANE	13 - MTV, CARGO
6 - MINE DISPENSER (FLIPPER)	18 - LMTV, CARGO
6 - 2 1/2-TON TRL	1 - 4,000-LB FORKLIFT R/T
3 - FLOODLIGHT SET, TRL MTD	15 - MTV, TRACTOR
9 - ROAD GRADER	33 - HMMWV, CARGO
2 - MKT	32 - MTV, DUMP
6 - MICLIC	15 - DEUCE
9 - SCOOP LOADER	4 - MTV, WRECKER
1 - LUB-SERV UNIT, TRL MTD	4 - 3/4-TON TRL
9 - ROLLER, TOWED, VIBRATORY	1 - WELDING TRL
3 - ROLLER, TOWED, PNEU	6 - HETO
9 - SCRAPER	18 - 4-TON BOLSTER TRL
15 - 25-TON SEMITRAILER, LOW BED	2 - 400-GAL WATER TRL
4 - HMMWV, HVY VARIANT	14 - LMTV TRL
4 - HYSTRU	4 - MTV TRL
18 - SEE	

# ENGINEER BATTALION, CORPS (LIGHT)

TOE 05445L200

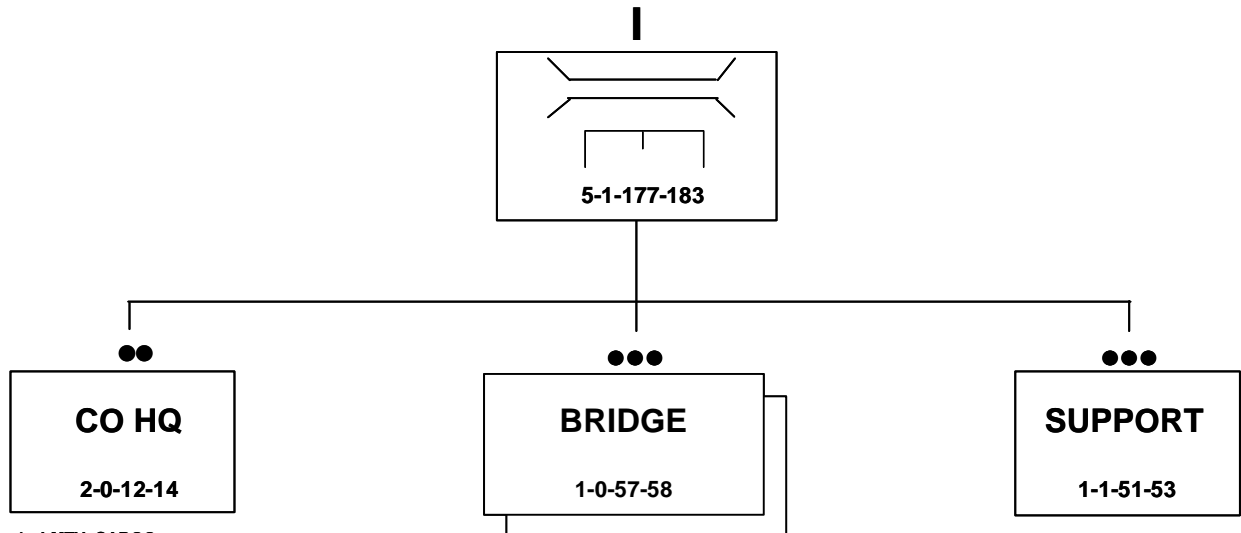


## EQUIPMENT RECAPITULATION

4 - STEAM CLEANER, TRL MTD	3 - ROLLER, TOWED, PNEU	15 - DEUCE
3 - 7 1/2-TON CRANE	9 - SCRAPER	4 - MTV, WRECKER
6 - MINE DISPENSER (FLIPPER)	15 - 25-TON SEMITRAILER, LOW BED	4 - 3/4-TON TRL
3 - 2,500-GAL WATER DIST	4 - HMMWV, HVY VARIANT	1 - WELDING TRL
6 - MINE DISPENSER (HTLD)	4 - HYSTRU	6 - HETO
6 - 2 1/2-TON TRL	18 - SEE	18 - 4-TON BOLSTER TRL
3 - FLOODLIGHT SET, TRL MTD	1 - HMMWV, AMBULANCE	2 - 400-GAL WATER TRL
9 - ROAD GRADER	10 - MTV, CARGO	14 - LMTV TRL
2 - MKT	18 - LMTV, CARGO	4 - MTV TRL
6 - MICLIC	1 - 4,000-LB FORKLIFT R/T	3 - MTV, FUELER
9 - SCOOP LOADER	15 - MTV, TRACTOR	
1 - LUB-SERV UNIT, TRL MTD	33 - HMMWV, CARGO	
9 - ROLLER, TOWED, VIBRATORY	32 - MTV, DUMP	

# ENGINEER MULTIROLE BRIDGE COMPANY

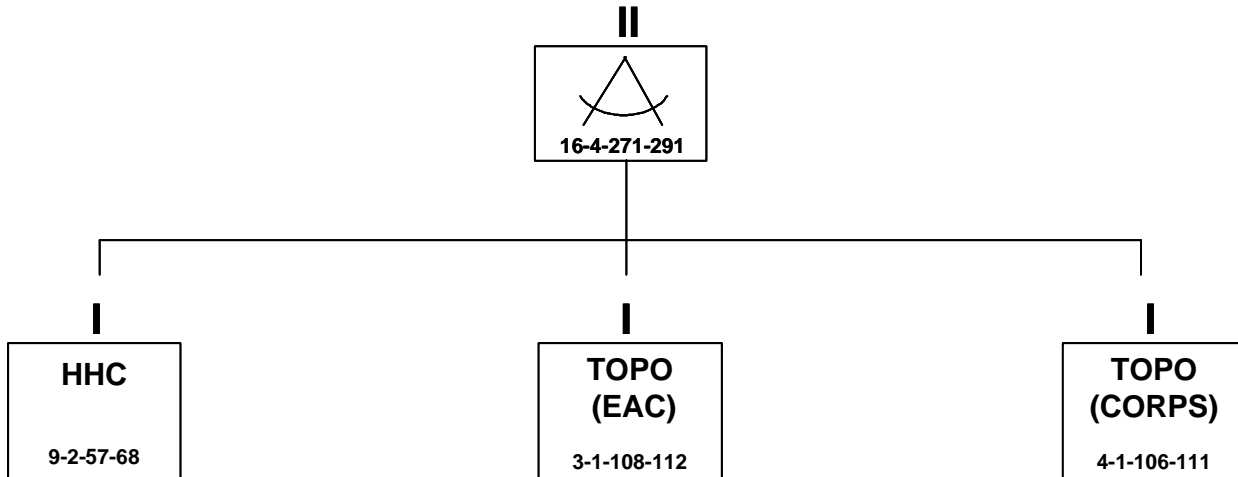
TOE 05473L000





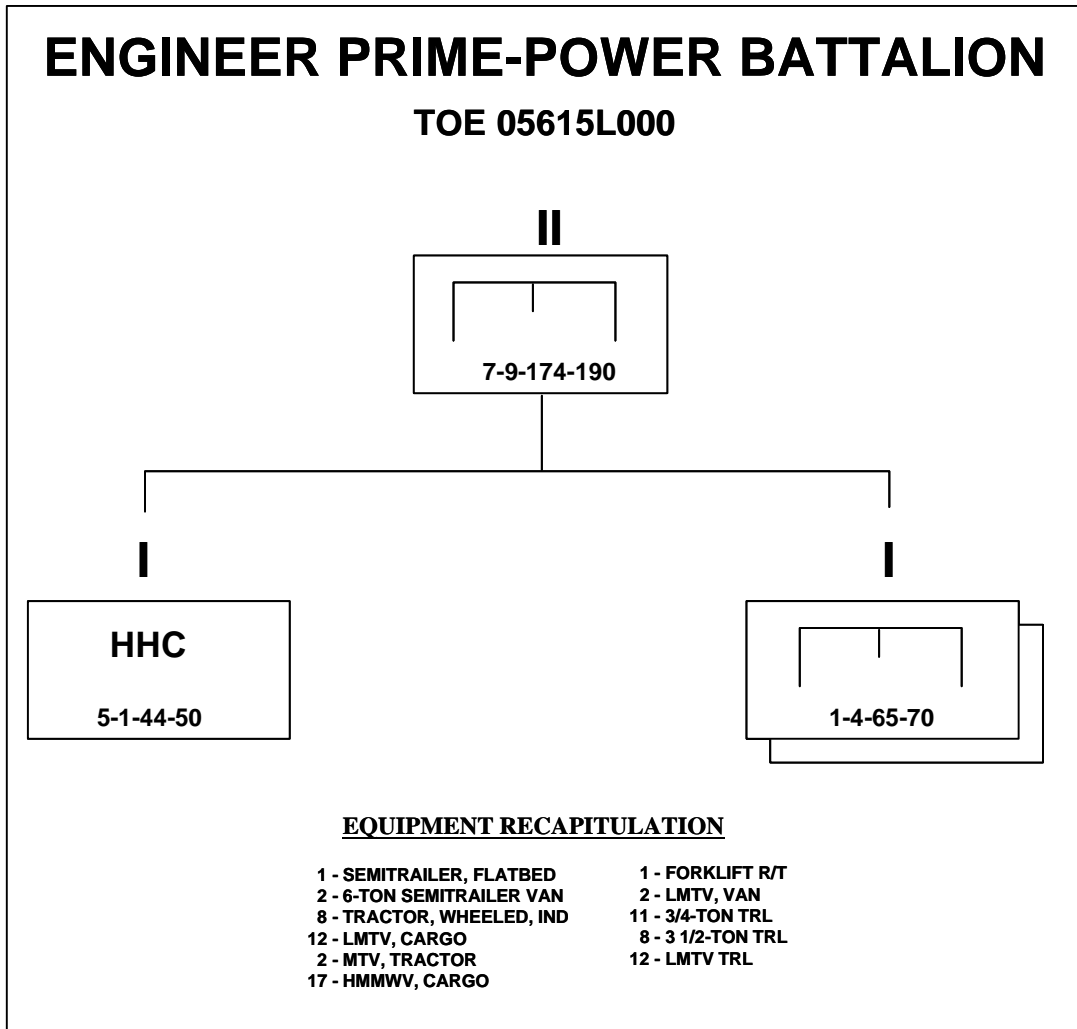
## Appendix A

# ENGINEER BATTALION (TOPOGRAPHIC) THEATER ARMY TOE 05605L000



### EQUIPMENT RECAPITULATION

2 - STEAM CLEANER, TRL MTD	1 - MTV, WRECKER
3 - MKT	21 - 3/4-TON TRL
1 - 6-TON SEMITRAILER VAN	3 - 400-GAL WATER TRL
4 - 12-TON SEMITRAILER VAN	2 - 1,000-GAL WATER TRUCK
8 - HMMWV, HVY VARIANT	8 - LMTV TRL
2 - 4,000-LB FORKLIFT R/T	2 - MTV TRL
15 - LMTV, CARGO	3 - MTV, FUELER
25 - TRUCK, TRACTOR (M915)	
47 - HMMWV, CARGO	
10 - HMMWV, EXPANDED CAP	
3 - MTV, CARGO	



## **Appendix A**

### **Notes**

**APPENDIX B**

**ENGINEER SYSTEM PRIORITY LIST  
January 2001**

1. Grizzly
2. Wolverine
3. Digital Topographic Support System (DTSS)
4. Maneuver Control System – Engineer (MCS-E)
5. Engineer Bradley Fighting Vehicle (EBFV)
6. Raptor Intelligent Combat Outpost
  - Hornet
  - Hornet Product Improvement Program
7. Standoff Minefield Detection System (STAMIDS)
  - Handheld
  - Ground
  - Air
8. Bridging Suite
  - Heavy Dry-Support Bridge (HDSB)
  - Improved Ribbon Bridge (IRB)
  - Line-of-Communications Bridge (LOCB)
  - Common Bridge Transporter (CBT)
9. Countermine Capability Set (CMCS)
10. Construction Equipment

**Notes**

## GLOSSARY

<b>1CD</b>	1st Cavalry Division
<b>2ID</b>	2d Infantry Division
<b>3ACR</b>	3d Armored Cavalry Regiment
<b>3-D</b>	three-dimensional
<b>3ID</b>	3d Infantry Division
<b>4ID</b>	4th Infantry Division
<b>AAO</b>	Army acquisition objective
<b>AASHTO</b>	American Association of State Highway and Transportation Officials
<b>AASLT</b>	air assault
<b>ABCS</b>	Army Battle Command System
<b>ABN</b>	airborne
<b>AC</b>	active component; alternating current
<b>ACALA</b>	United States Army Armored and Chemical Acquisition and Logistics Activity
<b>ACAT</b>	acquisition category
<b>ACE</b>	armored combat earthmover
<b>ACR</b>	armored cavalry regiment
<b>ACT II</b>	Advanced Concept and Technology II
<b>AD</b>	advanced development
<b>ADA</b>	air-defense artillery
<b>ADAM</b>	area denial artillery munition
<b>ADE</b>	assistant division engineer
<b>AISI</b>	Automated Integrated Survey Instrument
<b>AIT</b>	advanced individual training
<b>al</b>	aluminum
<b>alum</b>	aluminum
<b>AMBL</b>	airmobile
<b>AMC</b>	United States Army Materiel Command
<b>ammo</b>	ammunition
<b>ANCOC</b>	Advanced Noncommissioned Officer Course
<b>AOE</b>	Army of Excellence
<b>AP</b>	antipersonnel
<b>APC</b>	armored personnel carrier
<b>APLA</b>	antipersonnel land-mine alternative

## Glossary

<b>APO</b>	Army procurement objective
<b>APOBS</b>	Antipersonnel Obstacle Breaching System
<b>AR</b>	Army regulation; Armor Branch
<b>armt</b>	armament
<b>ARNG</b>	Army National Guard
<b>AS</b>	acquisition strategy
<b>ASA</b>	Assistant Secretary of the Army
<b>ASI</b>	additional skill identifier
<b>asslt</b>	assault
<b>ASTAMIDS</b>	Airborne Standoff Minefield Detection System
<b>ASTM</b>	American Society of Testing and Materials
<b>AT</b>	antitank
<b>ATCOM</b>	United States Army Aviation and Troop Command
<b>ATEC</b>	all-terrain crane; United States Army Testing and Evaluation Command
<b>AVLB</b>	armored-vehicle-launched bridge
<b>AWG</b>	American wire gauge
<b>BAP</b>	bridge adapter pallet
<b>BASIC</b>	body armor set, individual countermine
<b>BCT</b>	basic combat training
<b>bde</b>	brigade
<b>BEB-SD</b>	bridge erection boat – shallow draft
<b>BFA</b>	battlefield functional area
<b>BFV</b>	Bradley fighting vehicle
<b>bn</b>	battalion
<b>BNCOC</b>	Basic Noncommissioned Officer Course
<b>BOD</b>	base ordnance depot
<b>BOI</b>	basis of issue
<b>BOIP</b>	basis-of-issue plan
<b>BOS</b>	battlefield operating system
<b>C<sup>2</sup></b>	command and control
<b>C4</b>	composition C4
<b>C4I</b>	command, control, communications, computers, and intelligence
<b>CARTO</b>	cartography; cartographic
<b>CB</b>	chemical/biological
<b>cbt</b>	combat
<b>CBT</b>	common bridge transporter



<b>CBTDEV</b>	combat developer
<b>CBU</b>	cluster bomb unit
<b>CD-ROM</b>	compact disk—read-only memory
<b>CECOM</b>	United States Army Communications-Electronics Command
<b>cfm</b>	cubic feet per minute
<b>CHS I</b>	Common Hardware/Software I
<b>cl</b>	class
<b>CM</b>	Chemical Corps
<b>CMCS</b>	Countermine Capability Set
<b>CMF</b>	career management field
<b>CMT</b>	contact maintenance truck
<b>co</b>	company
<b>CO<sub>2</sub></b>	carbon dioxide
<b>COEA</b>	cost and operational effectiveness analysis
<b>COI</b>	critical operational issues
<b>commo</b>	communications
<b>comp</b>	component; composition
<b>cond</b>	conditioning
<b>const</b>	construction
<b>CONUS</b>	continental United States
<b>conv</b>	conversion
<b>COTS</b>	commercial off the shelf
<b>CP</b>	command post
<b>CSA</b>	Chief of Staff of the Army
<b>CSC</b>	combat-support company
<b>CSE</b>	combat-support equipment
<b>CSS</b>	combat service support
<b>CSWP</b>	crushing, screening, and washing plant
<b>CTA</b>	common table of allowances
<b>CTIS</b>	Combat Terrain Information Systems
<b>CUCV</b>	commercial utility cargo vehicle
<b>DA</b>	Department of the Army
<b>DARPA</b>	Defense Advanced Research Projects Agency
<b>DAT</b>	digital audiotape
<b>DC</b>	direct current
<b>DCD</b>	Directorate of Combat Developments

## Glossary

<b>DCP</b>	decision coordination paper
<b>DCSOPS</b>	Deputy Chief of Staff for Operations and Plans
<b>DCSPRO</b>	Deputy Chief of Staff for Programs
<b>DCU</b>	dispenser control unit
<b>DDSS</b>	Downsized Direct-Support System
<b>DEUCE</b>	Deployable Universal Combat Earthmover
<b>disp</b>	dispensing
<b>dist</b>	distribution
<b>distr</b>	distributor
<b>div</b>	division
<b>DOD</b>	Department of Defense
<b>DOS</b>	Disk Operating System
<b>DOT</b>	Directorate of Training
<b>DPGDS</b>	Deployable Power Generation/Distribution System
<b>DSN</b>	defense switched network
<b>DSS</b>	Direct-Support System
<b>DT</b>	developmental test
<b>DTSS</b>	Digital Topographic Support System
<b>DTSS-B</b>	Digital Topographic Support System—Base
<b>DTSS-D</b>	Digital Topographic Support System—Deployable
<b>DTSS-H</b>	Digital Topographic Support System—Heavy
<b>DTSS-L</b>	Digital Topographic Support System—Light
<b>EAC</b>	echelons above corps
<b>EBFV</b>	Engineer Bradley Fighting Vehicle
<b>ED</b>	engineering development
<b>EMD</b>	engineering and manufacturing development
<b>EMM-BD</b>	engineer mission modules—bituminous distributor
<b>EMM-CM</b>	engineer mission modules—concrete
<b>EMM-DB</b>	engineer mission modules—dump body
<b>EMM-WD</b>	engineer mission modules—water distributor
<b>en</b>	engineer
<b>engr</b>	engineer
<b>ENS</b>	explosive neutralization system
<b>EO/IR</b>	electro-optic/infrared
<b>EOAC</b>	Engineer Officer Advanced Course
<b>EOBC</b>	Engineer Officer Basic Course

<b>EOD</b>	explosive ordnance disposal
<b>EPA</b>	Environmental Protection Agency
<b>eqp</b>	equipment
<b>equip</b>	equipment
<b>ERDAS</b>	Earth Resources Data Analysis System
<b>erect</b>	erection
<b>ESMC</b>	explosive standoff minefield breacher
<b>ESV</b>	engineer squad vehicle
<b>ex</b>	expendable
<b>Ext</b>	extension
<b>FA</b>	field artillery
<b>FASCAM</b>	family of scatterable mines
<b>FBCB2</b>	Force XXI Battle Command—Brigade and Below
<b>FCS</b>	Future Combat System
<b>FCT</b>	foreign comparative test
<b>FDT&amp;E</b>	force-development test and experimentation
<b>fix</b>	fixed
<b>fl</b>	floating
<b>FLS</b>	floodlight set
<b>FM</b>	field manual
<b>FMTV</b>	family of medium tactical vehicles
<b>FOL</b>	family of loaders
<b>FORSCOM</b>	United States Army Forces Command
<b>FPE</b>	firefighter's protective equipment
<b>fps</b>	feet per second
<b>frag</b>	fragmentation
<b>FSD</b>	full-scale development
<b>FUE</b>	first unit equipped
<b>FXXI</b>	Force XXI
<b>FY</b>	fiscal year
<b>g</b>	gram(s)
<b>gal</b>	gallon(s)
<b>GB</b>	gigabyte
<b>GDU</b>	GSTAMIDS display unit
<b>GEMSS</b>	Ground-Emplaced Mine-Scattering System
<b>GIS</b>	Geographic Information System

## **Glossary**

<b>GPR</b>	ground penetrating radar
<b>GPS</b>	Global Positioning System
<b>GSA</b>	General Services Administration
<b>GSTAMIDS</b>	Ground Standoff Minefield Detection System
<b>HDSB</b>	heavy dry-support bridge
<b>HEC</b>	heavy engineer crane
<b>HEMTT</b>	heavy, expanded mobility, tactical truck
<b>HETO</b>	hydraulic electric tool outfit
<b>HHC</b>	headquarters and headquarters company
<b>HMEE</b>	high-mobility engineer excavator
<b>HMMWV</b>	high-mobility, multipurpose, wheeled vehicle
<b>HQ</b>	headquarters
<b>HQDA</b>	Headquarters, Department of the Army
<b>hr</b>	hour(s)
<b>HSB</b>	headquarters and service battery
<b>HSC</b>	high-speed compactor
<b>HSTAMIDS</b>	Handheld Standoff Minefield Detection System
<b>HSTRU</b>	hydraulic-system test and repair unit
<b>HTLD</b>	high-technology light division
<b>HVMP</b>	high-volume map production
<b>hvy</b>	heavy
<b>hw</b>	highway
<b>Hydo</b>	hydrographic
<b>HYEX</b>	hydraulic excavator
<b>Hz</b>	hertz
<b>IAV</b>	interim armored vehicle
<b>I-BASIC</b>	improved body armor set, individual countermine
<b>IBC</b>	improved boat cradle
<b>IBCT</b>	interim brigade combat team
<b>IBP</b>	image-based product
<b>ICU</b>	intrusion-sensing control unit
<b>ICV</b>	infantry carrier vehicle
<b>IDIV</b>	Interim Division
<b>IET</b>	initial-entry training
<b>IFF</b>	identification, friend or foe
<b>ILS</b>	integrated logistic support

<b>IN</b>	Infantry Branch
<b>inf</b>	infantry
<b>info</b>	information
<b>IOC</b>	initial operational capability
<b>IOT&amp;E</b>	initial operational test and evaluation
<b>IPA</b>	integrated program assessment
<b>IPR</b>	in-process review
<b>IRB</b>	improved ribbon bridge
<b>IPS</b>	integrated program summary
<b>ISO</b>	International Standards Organization
<b>IVMMD</b>	interim vehicular-mounted mine detection
<b>JFIRE</b>	Joint-Firefighter Integrated Response Ensemble
<b>JROC</b>	Joint Requirements Oversight Council
<b>JRTC</b>	Joint Readiness Training Center
<b>JSOR</b>	joint services operational requirement
<b>kg</b>	kilogram(s)
<b>km</b>	kilometer(s)
<b>kW</b>	kilowatt
<b>LAN</b>	local-area network
<b>lb</b>	pound(s)
<b>LCSS</b>	Lightweight Camouflage Screening System
<b>LET</b>	light equipment transporter
<b>lgt</b>	light
<b>LHS</b>	Load Handling System
<b>LID</b>	light infantry division
<b>LIN</b>	line item number
<b>liq</b>	liquid
<b>LLD</b>	laser leveling device
<b>LMTV</b>	light medium tactical vehicle
<b>LOC</b>	line of communications
<b>LOCB</b>	line-of-communications bridge
<b>LRIP</b>	low-rate initial production
<b>LRS</b>	link reinforcement set
<b>LRU</b>	line replaceable unit
<b>lt</b>	light
<b>LTR</b>	light tactical raft

## Glossary

<b>lub</b>	lubrication
<b>LUT&amp;E</b>	limited user test and evaluation
<b>MAA</b>	mission area analysis
<b>MACO</b>	mechanical-arm confirmation operator
<b>MACOM</b>	major command
<b>maint</b>	maintenance
<b>MANPRINT</b>	manpower and personnel integration
<b>MANSCEN</b>	United States Army Maneuver Support Center
<b>MAP</b>	Military Assistance Program
<b>MATDEV</b>	materiel developer
<b>MB</b>	megabyte(s)
<b>MCS</b>	Maneuver Control System
<b>MCS-E</b>	Maneuver Control System—Engineer
<b>MDI</b>	modernized demolition initiator
<b>MDV</b>	mine-detection vehicle
<b>mech</b>	mechanical, mechanized
<b>METL</b>	mission-essential task list
<b>METT-TC</b>	mission, enemy, terrain, troops, time available, and civilian considerations
<b>MGB</b>	medium-girder bridge
<b>MGI</b>	military geographic information
<b>MICLIC</b>	mine-clearing line charge
<b>min</b>	minute(s)
<b>MKT</b>	mobile kitchen trailer
<b>MLC</b>	military load classification
<b>mm</b>	millimeter(s)
<b>MNS</b>	mission needs statement
<b>mob</b>	mobility
<b>moist</b>	moisture
<b>MOPMS</b>	Modular-Pack Mine System
<b>MOS</b>	military occupational specialty
<b>mos</b>	mosaic
<b>MP</b>	military police
<b>MPCV</b>	mine-protected clearance vehicle
<b>MRBC</b>	multirole bridge company
<b>MS</b>	milestone
<b>MSC</b>	major subordinate command

<b>MSIP</b>	multispectral imagery processor
<b>mtd</b>	mounted
<b>MTOE</b>	modified table(s) of organization and equipment
<b>MTT</b>	mobile training team
<b>MTV</b>	medium tactical vehicle
<b>N/A</b>	not applicable
<b>NATO</b>	North Atlantic Treaty Organization
<b>NBC</b>	nuclear, biological, and chemical
<b>NCO</b>	noncommissioned officer
<b>NCOES</b>	Noncommissioned Officers Education System
<b>NDI</b>	nondevelopmental item
<b>NET</b>	new equipment training
<b>NIMA</b>	National Imagery and Mapping Agency
<b>NLOS</b>	nonline of sight
<b>No.</b>	number
<b>NSC</b>	National Security Council
<b>NSD-A</b>	non-self-destruct alternative
<b>NSN</b>	national stock number
<b>NT</b>	new technology
<b>NTC</b>	National Training Center
<b>O&amp;O</b>	operational and organizational
<b>OCONUS</b>	outside of the continental United States
<b>OCU</b>	operator control unit
<b>OD</b>	Ordnance Branch
<b>ODS-E</b>	Operation Desert Storm—Engineer
<b>OJT</b>	on-the-job training
<b>OMS</b>	obstacle marking system
<b>op</b>	operations
<b>opera</b>	operations
<b>OR</b>	operational readiness
<b>ORD</b>	operational requirements document
<b>ORF</b>	operational readiness float
<b>OSD</b>	Office of Secretary of Defense
<b>OSD (ALT)</b>	Office of Secretary of Defense (Acquisition, Logistics, and Technology)
<b>OSUT</b>	one-station unit training
<b>OT</b>	operational test

## Glossary

<b>OT&amp;E</b>	operational test and evaluation
<b>P3I</b>	preplanned product improvement
<b>p/l</b>	pipeline
<b>PASGT</b>	Personnel Armor System for Ground Troops
<b>PBD</b>	Program Budget Decision
<b>PDRR</b>	program definition and risk reduction
<b>pet</b>	petroleum
<b>PETN</b>	pentaerythrite tetranitrate
<b>PFS</b>	Pipe Fascines System
<b>phot</b>	photo
<b>photomech</b>	photomechanical
<b>PIP</b>	Product Improvement Program
<b>PIR</b>	passive infrared
<b>pl</b>	power line
<b>pldr</b>	pile driving
<b>PLS</b>	Palletized Load System
<b>plt</b>	plant; platoon
<b>PM</b>	project manager; product manager
<b>pneu</b>	pneumatic
<b>POC</b>	point of contact
<b>POI</b>	program of instruction
<b>POL</b>	petroleum, oil, and lubricants
<b>POM</b>	program objective memorandum
<b>POMCUS</b>	pre-positioned organizational materiel configured to unit sets
<b>PPBS</b>	planning, programming, and budgeting system
<b>Prnt</b>	print
<b>pro</b>	processing
<b>proc</b>	processor
<b>ptbl</b>	portable
<b>PVT</b>	position, velocity, and timing; production verification testing; private
<b>Q</b>	quarter
<b>QM</b>	quartermaster
<b>QQPRI</b>	Qualitative and Quantitative Personnel Requirements Information
<b>QRMP</b>	quick-response multicolor printer
<b>QUADCON</b>	quadruple container
<b>R&amp;D</b>	research and development



<b>R/T</b>	radio/telephone
<b>RAAM</b>	remote antiarmor mine
<b>RADAM</b>	remote area denial artillery munition
<b>RAM</b>	reliability, availability, and maintainability
<b>RC</b>	reserve component
<b>RCU</b>	remote-control unit
<b>RDT&amp;E</b>	research, development, test, and evaluation
<b>RDX</b>	rapid-detonating explosive
<b>read</b>	reading
<b>REBS</b>	Rapidly Emplaced Bridge System
<b>repro</b>	reproduction
<b>req</b>	requirements
<b>ret</b>	retrieval
<b>RF</b>	radio frequency
<b>RIA</b>	Rock Island Arsenal
<b>ROC</b>	required operational capability
<b>RSTA</b>	reconnaissance, surveillance, and target acquisition
<b>S2</b>	Intelligence Officer (US Army)
<b>S3</b>	Operations and Training Officer (US Army)
<b>SASO</b>	stability and support operations
<b>SC</b>	supply catalog
<b>SCATMINE</b>	scatterable minefield
<b>SCBA</b>	self-contained breathing apparatus
<b>SCP</b>	system concept paper
<b>scrn</b>	screening
<b>SDASS</b>	special divers air-support system
<b>sec</b>	second(s); section
<b>SEE</b>	small emplacement excavator
<b>sep</b>	separate
<b>SEP</b>	System Enhancement Package
<b>serv</b>	servicing
<b>SETAF</b>	Southern European Task Force
<b>SFC</b>	soldier fighting cover; sergeant first class
<b>SHM</b>	Self-Healing Minefield
<b>SIB</b>	separate infantry brigade
<b>SIP</b>	System Improvement Plan

## Glossary

<b>SKO</b>	set, kit, and outfit
<b>SLAM</b>	selectable lightweight attack munition
<b>SLCET</b>	semitrailer, low-bed, construction equipment transporter
<b>SLEP</b>	Service-Life Extension Program
<b>SLOT</b>	self-load off-load trailer
<b>SME</b>	subject-matter expert
<b>SOC</b>	Special Operations Command
<b>SOF</b>	special-operations forces
<b>SON</b>	statement of need
<b>SOP</b>	standing operating procedure
<b>SORD</b>	statement of operational requirement document
<b>spt</b>	support
<b>SRB</b>	standard ribbon bridge
<b>SRC</b>	special requirements code
<b>SRS</b>	Standard Robotic System
<b>SSDS</b>	surface-supplied diving set
<b>st</b>	set
<b>STAMIDS</b>	Standoff Minefield Detection System
<b>stl</b>	steel
<b>stor</b>	storage
<b>STU</b>	secure telephone unit
<b>sup</b>	supply
<b>suppl</b>	supplementary
<b>supple</b>	supplemental
<b>SW</b>	special warfare
<b>TACOM</b>	United States Army Tank-Automotive and Armaments Command
<b>TACOM-RIA</b>	United States Army Tank-Automotive and Armaments Command—Rock Island Arsenal
<b>TACOM-W</b>	United States Army Tank-Automotive and Armaments Command—Warren
<b>tact</b>	tactical
<b>TADSS</b>	training aids, devices, simulations, and simulators
<b>TBD</b>	to be determined
<b>TBM</b>	tactical ballistic missile
<b>TC</b>	type classification
<b>TDA</b>	table of distribution and allowances
<b>TEL</b>	transporter erector launcher
<b>TENCAP</b>	tactical exploitation of national capabilities

<b>TF</b>	task force
<b>TFFS</b>	Tactical Fire-Fighting System
<b>TFFT</b>	tactical fire-fighting truck
<b>TIES</b>	Terrain Information Extraction System
<b>TIIP</b>	terrain imagery integration prototype
<b>tm</b>	team
<b>TM</b>	technical manual
<b>Tml</b>	terminal
<b>TNT</b>	trinitrotoluene
<b>TO</b>	theater of operations
<b>TOE</b>	table(s) of organization and equipment
<b>topo</b>	topographic(al)
<b>TOR</b>	tactical operational requirement
<b>TOW</b>	tube-launched, optically tracked, wire-guided
<b>TPH</b>	tons per hour
<b>TRADOC</b>	United States Army Training and Doctrine Command
<b>trans</b>	transportation
<b>trk</b>	truck
<b>trl</b>	trailer
<b>trng</b>	training
<b>trns</b>	transportable
<b>TSP</b>	training support package
<b>TSS</b>	Topographic Support System
<b>TUAV</b>	tactical unmanned aerial vehicle
<b>UCS</b>	underwater construction set
<b>UGV</b>	unmanned ground vehicle
<b>ULCANS</b>	Ultralightweight Camouflage Net System
<b>UPIK</b>	universal power interface kit
<b>USA</b>	United States Army
<b>USAES</b>	United States Army Engineer School
<b>USAF</b>	United States Air Force
<b>USAIS</b>	United States Army Infantry School
<b>USARPAC</b>	United States Army, Pacific
<b>USAR</b>	United States Army Reserve
<b>USAREUR</b>	United States Army, Europe
<b>USMC</b>	United States Marine Corps

## Glossary

<b>V</b>	volt(s)
<b>VCSA</b>	Vice Chief of Staff of the Army
<b>veh</b>	vehicle
<b>VT</b>	vehicle teleoperation; virtual terminal
<b>w/</b>	with
<b>w/L</b>	with light
<b>w/M</b>	with medium
<b>WAM</b>	wide-area munition
<b>WAN</b>	wide-area network
<b>WFEL</b>	Williams-Fairey Engineering Limited
<b>whl</b>	wheeled
<b>WWS</b>	woodworking set
<b>xmsn</b>	transmission

**acquisition categories (ACAT)** the categories that determine the level of review and decision authority for defense acquisition programs

**acquisition strategy (AS)** the conceptual framework for conducting materiel acquisition, encompassing broad concepts and objectives that direct and control overall development, production, and deployment of a materiel system. It evolves parallel with system maturation. Must be stable enough to provide continuity but dynamic enough to accommodate change. It is documented and approved as an annex to the integrated program assessment (IPA) at Milestone 1.

**advanced development (AD)** projects that have moved into the development of hardware for development or operational testing

**army acquisition objective (AAO)** the quantity of an item authorized for peacetime acquisition to equip the US Army-approved force and specified allies in peacetime, and sustain these forces in wartime from D-Day through the period, and at the level of support prescribed by the latest Office of the Secretary of Defense (OSD) material-support planning guidance.

**component acquisition executive** the single official responsible for all acquisition functions within a Department of the Army (DOD) military department or agency, such as the service acquisition executive

**basis of issue (BOI)** authority that prescribes the number of items that may be issued to an individual, a unit, or an activity. It is stated in authorization documents.

**combat developer (CBTDEV)** command or agency that formulates doctrine, concepts, organization, material requirements, and objectives. The CBTDEV represents the user community in the materiel acquisition process.

**commercial products or items** products or items in regular production sold in substantial quantities to the general public and industry at established market or catalog prices.

**concept baseline** the acquisition program baseline approved at Milestone 1. It contains broad objectives and thresholds for key cost, schedule, and performance parameters applicable to the effort in Phase 1, Demonstration and Validation. (The development baseline is still required at Milestone II and the production baseline at Milestone III.)

**concept exploration and definition phase** initial phase of the materiel acquisition process. During this phase, the acquisition strategy is developed, system alternatives are proposed and examined, and the material requirements document is redefined to support subsequent phases.

**cost and operational effectiveness analysis (COEA)** comparison between costs to develop, produce, distribute, and maintain a materiel system and the ability of the system to meet the requirement for eliminating or reducing a force or mission deficiency.

**demonstration and validation phase** normally the second phase in the acquisition process. Consists of steps necessary to resolve or minimize logistics problems identified during concept exploration, verify preliminary design and engineering, accomplish necessary planning, fully analyze trade-off proposals, and prepare the contract required for full-scale development (FSD).

**development test (DT)** testing of materiel systems conducted by the materiel developer (MATDEV) using the principle of a single, integrated DT cycle to do the following: a) demonstrate that design risks have been minimized, b) ensure that the engineering development process is complete and the system meets specifications, c) estimate the system's military use when it is introduced

**doctrine** the fundamental principles by which the military force, or elements, guides its actions to support the national objectives. It is authoritative but requires judgment in application.

**engineering and manufacturing development phase** normally the third phase in the materiel acquisition process during which a system, including all items necessary for its support, is fully developed, engineered, fabricated, tested, and initially type classified

**engineering development (ED)** a research, development, test, and evaluation (RDT&E) funding category that includes the development programs being engineered for service use but not yet approved for procurement or operation

**event-based contracting** supports the event-driven acquisition strategy by linking specific contractual events to the "exit criteria" for the phase, or to intermediate development events established for the acquisition strategy

**event-driven acquisition strategy** an acquisition strategy that links program decisions to demonstrated accomplishments in development, testing, and production

**evolutionary requirements** mission needs are first expressed in broad operational capability terms and then progressively evolved to system-specific performance requirements

**exit criteria** programmed specific accomplishments that must be satisfactorily met before progressing further in an acquisition phase or transitioning to the next phase

## Glossary

**force-development testing and experimentation (FDTE)** tests that range from small, highly instrumental and high-resolution field experiments to larger, less instrumental, controlled scenarios and low-resolution field tests. FDTEs are conducted to evaluate new concepts or tactics, doctrine, and organizations by field units.

**in-process review** review of a project or program at critical points to evaluate status and make recommendations to the decision authority

**integrated logistic support (ILS)** composite of elements necessary to ensure effective and economical support of a system or equipment at all levels of maintenance for its programmed life cycle

**integrated program assessment (IPA)** a document prepared by the OSD staff for the milestone decision authority to support Milestone I, II, III, and IV reviews

**integrated program summary (IPS)** a document prepared by the program executive officer, with support from the program manager, and approved by the component acquisition executive to support milestone decision reviews. It replaces the system concept paper (SCP) at Milestone I and the decision coordination paper (DCP) at Milestones II, III, and IV.

**logistician** command or agency responsible for independent logistics surveillance and evaluation of materiel acquisition programs

**long-range investment plans** also called “long-range modernization and investment plans.” These are broad plans based on the best estimates of future top-line fiscal resources that form the basis for making long-range affordability assessments of acquisition programs. Along with defense planning guidance, these plans support Milestone 0 and 1 reviews. The plan is prepared by each DOD component with planning, programming, and budgeting system (PPBS) responsibilities and approved by the Deputy Secretary of Defense.

**materiel developer (MATDEV)** command or agency responsible for research, development, and production of a system in response to approved requirements

**materiel requirements document** document that states concisely the minimum essential operational, technical, logistical, and financial information necessary to initiate development or procurement of a materiel system. The operational requirements document (ORD) and the mission needs statement (MNS) are examples of a materiel requirements document.

**mission area analysis (MAA)** an assessment of the capability of a force to perform within a particular battlefield or functional area. It is designed to cover deficiencies in doctrine, organizations, training, and materiel and to identify a means of correcting these deficiencies. It provides a basis for applying advanced technology to future Army operations.

**mission area assessment** not defined, but includes a mission needs analysis. Apparently, this term is the same as “mission area analysis” used in the previous DoDI 5000.2. The process by which war-fighting deficiencies are determined, technological opportunities for increased system effectiveness

and/or cost reductions are assessed, and mission needs identified. It overlaps the mission need determination.

**mission need analysis** an assessment of alternatives in an operational contest, identifying what force capabilities would be gained (or foregone) by pursuing selected alternatives. It looks at the strengths and weaknesses of a military force when confronted with a postulated threat. It is part of the mission area assessment and the cost and operational effectiveness analysis (COEA).

**mission need determination** the process by which DOD components determine deficiencies in current capabilities and opportunities to provide new capabilities in terms of nonmaterial solutions and/or material solutions; for example, the process that leads (or doesn't lead) to a mission need statement

**mission need statement (MNS)** the requirements document resulting from ongoing mission area analyses which initiates the acquisition process when approved at Milestone 0 but does not initiate the acquisition program. It defines the needs in broad nonsystem-specific operational terms.

**operational capability need** not defined, but derived from mission need analysis (apparently related to the "war-fighting efficiency" term associated with MAA) and, along with assessing nonmaterial solutions and developing a mission need statement, is part of the mission need determination

**operational requirements document (ORD)** the requirements document that replaces the statement of need (SON), statement of operational requirement document (SORD), operational and organizational (O&O) plan, required operational capability (ROC), tactical operational requirement (TOR), operational requirement (OR), joint services operational requirement (JSOR), and other service-unique requirements documents. It is prepared by the user or the user's representative during the concept exploration and definition phase, approved by the service chief (or his designated representative), and submitted to the component acquisition executive (and the Joint Requirements Oversight Council [JROC] for acquisition category [ACAT] I programs), before Milestone 1. The ORD is updated for each subsequent milestone decision review. If a program is past Milestone II more than six months before the date of DoDI 5000.2, the service-unique requirements document does not have to be rewritten.

**operational test (OT)** testing and evaluation of materiel systems accomplished with typical user operators, crews, or units in as realistic an operational environment as possible to provide data for estimating the a) military utility, operational effectiveness, and operational suitability; b) system's desirability considering systems already available and the associated operational benefits or burdens; c) need for system modification; d) adequacy of doctrine, organization, operating techniques, tactics, and training for employment; e) adequacy of maintenance support; and f) system's performance in a countermeasures environment, when appropriate.

**operational test and evaluation (OT&E)** shall determine the operational effectiveness and suitability of a system under realistic operational conditions, including combat; determine if thresholds

## Glossary

and objectives in the approved ORD and the critical operational issues (COI) have been satisfied; and assess impacts to combat operations

**product improvement** effort to incorporate a configuration change involving engineering and testing on end items and depot repairable components, or changes on other than developmental items to increase system or combat effectiveness or extend the useful military life

**product and deployment phase** normally the fourth phase in the materiel acquisition process. Operational units are trained, equipment is procured to meet the Army acquisition objective and distributed, and logistical support is provided.

**requirement** A military requirement is an established need justifying the timely allocation of resources to achieve a capability to accomplish approved military objectives, missions, or tasks.

**training device** item designed, developed, and procured solely to simulate or demonstrate the function of equipment or systems to meet training support requirements

**type classification (TC)** identifies the life-cycle status of a materiel system after a production decision by assignment of TC designation. It is the records status of a materiel system in relation to its overall life history and a guide to procurement, authorization, logistical support, assets, and readiness reporting. It is the Army's implementation of OSD designation "accepted for service use."



## INDEX

25-Ton Trailer, M172A1	84
40-Pound Cratering Charge (1992 Version)	144
<b>A</b>	
Adhesive Paste, M1	144
Air-Assault (AASLT) Tactical Earthmoving Equipment (T-3/4 and T-5 Dozers)	85
Airborne/Air-Assault Grader	87
Airborne Scraper System, 2,500-Gallon	88
Airborne Standoff Minefield Detection System (ASTAMIDS)	2
All-Terrain Crane (ATEC), 22.5-Ton	89
All-Terrain Crane (ATEC) Pile Driver	32
Aluminum Floating Footbridge	44
AN/PSS-12 Handheld Portable Mine Detecting Set	45
Antipersonnel (AP) Mines; M14, M16, and M18	66
Antipersonnel Land-Mine Alternative (APLA)	21
Antipersonnel Obstacle Breaching System (APOBS)	3
Antitank (AT) Mines; M15, M19, and M21	68
Armored Combat Earthmover (ACE), M9	46
Armored-Vehicle-Launched Bridge (AVLB)	48
Asphalt Melter	90
Asphalt Mixing Plant	91
Assault Boat, 7-Man (Inflatable)	130
Assault Boat, 15-Man (Inflatable)	131
Automated Integrated Survey Instrument (AIS)	118
<b>B</b>	
Bailey Bridge, M2	49
Bangalore Torpedo, M1A1	50
Blasting-Cap Holder, M8	145
Blasting Caps	145
Blasting-Cap Test Set, M51	146
Blasting Machines	146
Bridge Conversion Set, Fixed Bridge	160
Bridge Erection Boat—Shallow Draft (BEB-SD)	51
Bridge Erection Set, Fixed Bridge: Highway; Pony Truss; Widened Roadway; Bailey Type; or Cable Reinforcement	161
Bridge Erection Set, Floating Bridge: Aluminum Deck Balk Superstructure	162
Bridge Erection Set, Floating Bridge: Class 60 With Steel Superstructure	163
Bridge Erection Set, Floating Bridge: Class 60 With Steel Superstructure or Floating Bridge With Aluminum Deck Balk Superstructure	164
Bridge, Fixed: Highway, Aluminum, 38 Feet Long	165
Bridge, Fixed: Highway; Pony Truss; Portable Panel; Widened Roadway; or Bailey Type	166
Bridge, Floating: Aluminum, Highway, Deck Balk Superstructure	167
Bridge, Floating: Raft Section, Light Tactical	168
Bridging Sets In Depot For Contingency Operations	169

## **Index**

### **C**

Cap Crimper, M2	147
Common Bridge Transporter (CBT)	53
Composition C4 M112 Block Demolition Charge	147
Composition C4 M118 Block Demolition Charge	148
Compressor, Diving, 40 Cubic Feet per Minute (cfm)	132
Countermining Capability Set (CMCS)	4
Crane, 7.5-Ton	92
Crushing and Screening Plant, 225 Tons Per Hour (TPH)	169

### **D**

Delay-Firing Device, M1	148
Demolition-Charge Assembly, M183	149
Demolition Equipment Set, Explosive Initiating, Electrical and Nonelectrical	170
Deployable Power Generation/Distribution System (DPGDS)	33
Deployable Universal Combat Earthmover (DEUCE)	93
Destructors	149
Detonating Cord	150
Detonating-Cord Clip, M1	150
Detonators	151
Digital Topographic Support System—Base (DTSS-B)	120
Digital Topographic Support System—Deployable (DTSS-D)	121
Digital Topographic Support System (DTSS)—High-Volume Map Production (HVMP)	31
Digital Topographic Support System—Heavy (DTSS-H)	123
Digital Topographic Support System—Light (DTSS-L)	124
Divers' Recompression Chamber	133
Diving Equipment Set, Individual Swimmer Support Set	134
Diving Equipment Set, Open-Circuit Scuba	135
Diving Equipment Set, Scuba Support, Type A	136
Diving Equipment Set, Scuba Support, Type B	137
Drafting Equipment Set: Battalion for Charts, Sketches, and Overlays	170
Dual Steel-Wheeled Roller	94
Dump Trucks	95

### **E**

Engineer Bradley Fighting Vehicle	6
Engineer Mission Modules—Bituminous Distributor (EMM-BD)	96
Engineer Mission Modules—Concrete Mobile (EMM-CM)	97
Engineer Mission Modules—Dump Body (EMM-DB)	98
Engineer Mission Modules—Water Distributor (EMM-WD)	34
Engineer Squad Carrier, M113	55
Engineer Squad Vehicle (ESV)	7
Engineer System Priorities	217

### **F**

Family of Loaders (FOL)	99
Family of Scatterable Mines (FASCAM) Characteristics	71
Firing Wire and Reels	152
Floodlight Set (FLS)	35
Fuse, M624	69

### **G**

Global Positioning System—Survey (GPS-S)	125
--	-----

Grizzly	8
Ground Standoff Minefield Detection System (GSTAMIDS)	10
<b>H</b>	
Handheld Standoff Minefield Detection System (HSTAMIDS)	12
Heavy Dry-Support Bridge (HDSB)	13
Heavy Engineer Crane (HEC)	36
Heavy Road Grader	100
High-Mobility Engineer Excavator (HMEE)	29
High-Speed Compactor (HSC)	101
Hornet (Wide-Area Munitions [WAM])	23
Hot-Oil Heater	102
Hydraulic Excavator (HYEX)	103
<b>I</b>	
Improved Body Armor Set, Individual Countermine (BASIC), Preplanned Product Improvement (P3I) (Also Known as Improved-BASIC [I-BASIC])	76
Improved Ribbon Bridge (IRB)	14
<b>J</b>	
Joint-Firefighter Integrated Response Ensemble (J-FIRE)	78
<b>L</b>	
Laser Leveling Device (LLD)	104
Light Set, Chart Field	171
Light Set: General; Illumination, 15 Kilowatt (kW)	171
Light Tactical Raft (LTR)	56
Line-of-Communications Bridge (LOCB)	15
Low-Bed Semitrailer, M870A3	105
<b>M</b>	
Maneuver Control System—Engineer (MCS-E)	37
Mat Set, Landing, XM18 and XM19	172
Medium-Girder Bridge (MGB), M3	57
Military Dynamite, M1	153
Mine-Clearing Line Charge (MICLIC), M58	58
Mine-Protected Clearance Vehicle (MPCV)	16
Modernized Demolition Initiators (MDIs)	154
Modular-Pack Mine System (MOPMS)	72
Mongoose—Explosive Standoff Minefield Breacher (ESMB)	17
<b>O</b>	
Obstacle Marking System (OMS)	18
Other Kits	180
<b>P</b>	
Paving Machine, Bituminous Material	106
Pipe Fascines System (PFS)	60
Pneumatic Tool and Compressor Outfit, 250 Cubic Feet Per Minute (cfm)	107

## Index

Pressure-Sensitive Adhesive Tape	155
Priming Adapters, M1A4 and M1A4A1	155
Pursuit-Deterrent Munition (PDM)	70

### R

Rapidly Emplaced Bridge System (REBS)	19
Raptor—Intelligent Combat Outpost	25
Reinforcement Set, Medium Girder	172
Repair and Refilling Kit, Carbon-Dioxide Extinguisher	180
Ribbon Bridge	61
Rock-Drilling Equipment: For Placement of Explosives	190

### S

Selectable Lightweight Attack Munition (SLAM), M4	27
Self-Load Off-Load Trailer (SLOT)	39
Shaped Demolition Charges	156
Shop Equipment, Contact Maintenance, Truck-Mounted	190
Shop Equipment, Cutting and Welding: Underwater, Electrical	173
Shop Equipment, General-Purpose Repair, Semitrailer-Mounted	191
Shop Equipment, Organizational Repair, Light, Truck-Mounted	191
Shop Equipment, Woodworking: Base Maintenance, Trailer-Mounted	192
Sketching Set, Surveying: Military Field Sketching	173
Small Emplacement Excavator (SEE)	79
Small Emplacement Excavator (SEE)—Hydraulic-Mounted Attachments	80
Soldier Fighting Cover (SFC)	81
Special Divers' Air-Support System (SDASS)	138
Standard Robotic System (SRS)	20
Supplementary Adhesive for Demolition Charge	157
Supplementary Set, Bridge	174
Surface-Supplied Diving Set (SSDS)	139
Surveying Set, General Purpose	174
Surveying Set, Topographic Section	175

### T

Tactical Fire-Fighting System (TFFS)	40
Tactical Fire-Fighting Truck (TFFT)	41
Test Set, Asphalt	175
Test Set, Concrete	176
Test Set, Soil	176
Time Blasting Fuse	157
Tool Kit, Carpenter: Engineer Platoon	181
Tool Kit, Carpenter: Engineer Squad	181
Tool Kit, Electrician	182
Tool Kit, Mason and Concrete Finisher	182
Tool Kit, Pioneer Engineer Combat Platoon	183
Tool Kit, Pioneer Engineer Squad: Land Clearing and Building Erection	183
Tool Kit, Pioneer Platoon: General Labor	184
Tool Kit, Pipe Fitter, 1/8- to 2-Inch-Diameter Pipe	184
Tool Kit, Pipe Fitter, Supplemental: 2 1/4- to 4-Inch-Diameter Pipe	185
Tool Kit, Pipeline Construction	185
Tool Kit, Pipeline Construction, Grooved Coupling: Pipeline Maintenance	186
Tool Kit, Plumber	186
Tool Kit, Precision Instrument Repair	187

## Index

Tool Kit, Rigging, Wire Rope: Cutting, Clamping, and Splicing, With Chest	187
Tool Kit, Supplemental Pipeline Construction, Welder's Miscellaneous Hand Tools and Equipment	188
Tool Outfit, Hydraulic-System Test and Repair Unit (HSTRU)	192
Tool Set, Pioneer Squad: Light	188
Topographic Support Sets	177
Topographic Support System (TSS)	126
Towed Pneumatic Roller	108
Tractor, Full-Track, Low-Speed, Medium T-9 Dozer (D-7)	109
Tractor-Scraper, 14 to 18 Cubic Yards	111
Trinitrotoluene (TNT) Block Demolition Charge	158
<b>U</b>	
Ultralightweight Camouflage Net System (ULCANS)	82
Underwater Construction Set (UCS)	140
Underwater Photographic-Support Set	141
Unit Reference Sheets	193
<b>V</b>	
Vibratory Plate Compactor	112
Vibratory Roller	113
Volcano Multiple-Delivery Mine System	73
Volcano, Trailer-Mounted	28
<b>W</b>	
Waterproof Sealing Compound	158
Well-Drilling System, 600-Foot	115
Wolverine	62
Woodworking Set (WWS)	42